Essays in Empirical Corporate Finance

Supervisors: Dr. Zhenxu Tong

Pr. Pengguo Wang

Submitted by

Hui Huang

to the University of Exeter as a thesis for the degree of Doctor of Philosophy in Finance,

October 2018

I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

(Signature) ……Hui Huang……

Acknowledgements

There is a long list of people whom I am grateful to for contributing to my research experience, though it is impossible to mention them all.

I am most grateful to my supervisor, Dr. Zhenxu Tong and Pr. Pengguo Wang, not only for supervising me, but also for their kindness, patience and persistent support. I am thankful to all the staff and academics at the Business School, and to all my friends and colleagues.

I must present my greatest thanks to my family. I would like to thank my father for encouraging me to study for a PhD. My mother always told me to trust myself and not to give up when I was in a fragile state. Also, I am grateful to my sister Vivi, who makes me feel warm all the times.

Abstract

This thesis contains three empirical papers on labor unions and corporate cash holdings, payout policy. Previous literature about firms' financial choices, such as corporate cash holdings, dividend payouts, and share repurchases, has focused on the effects of firm-level financial characteristics. This thesis investigates whether labor unions affect these financial policies in the international settings.

The second chapter examines the relation between the presence of labor unions and corporate cash holdings in the international setting. Firms in countries with higher union membership have less corporate cash holdings. This negative relation is stronger for firms in countries with weak employment protection legislation, firms in countries with a high degree of labor bargaining centralization, and financially constrained firms. Moreover, the market value of corporate cash holdings is lower for firms in countries with high union membership. The number of strikes and lockouts is higher in countries with more corporate cash holdings. It suggests that firms strategically choose corporate cash holdings to gain a bargaining position with labor in an international setting.

The third chapter examines the relation between the presence of labor unions and firms' dividend payouts. Firms in countries with higher union membership have more dividend payouts. This positive relation is stronger for firms in countries with weaker employment protection legislation, firms in countries with a higher degree of labor bargaining centralization. Moreover, this chapter conducts a smaller sample analysis and find that the announcement return and operating performance around the date of dividend increases (decreases) are positively (negatively) related to the union membership. In addition, the number of strikes & lockouts is higher in countries with less corporate payout. It suggests that firms strategically payout dividend to gain the bargaining position with labor in the international setting.

Chapter 4 examines the relation between the presence of labor unions and firms' share repurchases. Firms in countries with higher union membership have more share repurchases. This positive relation is stronger for firms in countries with weaker employment protection legislation, firms in countries with a higher degree of labor bargaining centralization. Similar with Chapter 2, this chapter finds that the announcement return and operating performance around the date of share repurchase are positively related to the union membership in small sample analysis. In addition, the number of strikes & lockouts is higher in countries with less share repurchases. It suggests that firms strategically increase share repurchases to gain the bargaining position with labor in the international setting.

Overall, these results are consistent with the bargaining hypotheses and suggest that firms strategically make financial choices against labor unions all over the world.

Contents

List of Figures and Tables

List of Tables

List of Figures

List of Appendix

Abbreviation

CAR Cumulative Abnormal Return

EPL Employment Protection Legislation

ICTWSS Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts

ILO International Labor Organization

R&D Research and Development

ROA Return on Asset

SIC Standard Industrial Classification Code

UK United Kingdoms

US United States of America

Introduction

1.1 Background and Motivation

Labor unions are a form of social organizations that represent and protect the legitimate rights and interests of workers. They are formed by workers because labor unions have more collective strength comparing with individuals. Workers exert collective pressure to force employers to improve their benefits including wage demands, improvements of working conditions and other benefits.

Labor unions play an important role in collective bargaining with employers. First, labor represent workers in collective bargaining with employers. In negotiations, they can help workers get more specific improvements in compensation, working conditions and other benefits through a variety of means; such as the threat of a strike with all their member workers. Second, labor unions combine their individual voices to be heard to affect firms' activities. For example, they can use their collective power to convince employers to make significant changes and improve their working benefits set by labor markets. Third, labor unions affect the legal and political environment through negotiations and several other measures. For instance, they encourage workers to vote, provide campaign support for local politicians to affect the legal and political environment (Gould, 2004).

Labor unions exert their effects on employers by shaping processes and mechanisms that their collective power influences firms' decisions making, including certification election, contract negotiations and grievance procedures. For example, if employers reject claims from labor unions organized by workers themselves, employees can request a certification election to get recognition of these unions. The election is held through secret ballot voting, labor unions will be attained legal recognition if they get a majority of the votes. After certification election, employers are obliged to negotiate with labor unions for their requests. Then, union representatives and employers bargain for their benefits in contract negotiations. If they still

cannot arrive an agreement in this bargaining process, unions may organize a strike and employers may announce a lockout. However, strike and lockout are usually used as the last resort to solve the conflicts between labor unions and employers. Instead, they use grievance procedures to solve these problems. Grievance procedures is a quasi-judicial process that unions representatives and employers solve their conflicts through in a number of meetings with more expertise and increasing authority (Clark and Sadler, 2010). Through these processes, labor unions give opportunities to employees to make their voice be heard and influence firm's activities.

The collective power of labor unions affects a firm's financial policies. For example, Leontief (1946) state that the wage was set by labor unions before the level of employment is set by firms. Moreover, McLaughlin and Fraser (1984) emphasize that labor unions represent employees' benefits and play an important role in collective bargaining. As a result, firms take several measures when there are strong labor unions, such as leverage (Bronars and Deere, 1991; Perotti and Spier, 1993; Matsa, 2010; Myers and Saretto, 2015), earnings management (DeAngelo and DeAngelo, 1991), cash holdings (Klasa, Maxwell and Ortiz-Molina, 2009; Tong and Huang, 2018) and so on.

However, most papers about the relation between labor unions and corporate finance use US data. Labor unions are a prevalent phenomenon around the world. For example, Visser (2006) shows that the union density ranges from 8.1% to 78.0% in 24 countries in 2001.

Besides, the function of labor unions varies across countries under different labor policies. First, in most countries, employees have the right to choose a particular union to represent them. Different labor unions represent different proportions of employees in a bargaining unit. This proportional representation results in multiple unions representation in these countries (e.g. Western Europe, Australia, Israel, etc.). In a bargaining unit, employees are protected by various labor unions, employers must negotiate with all unions that are

involved in this unit. This multi representation situation does not apply in employees in United States, instead, the union representation is exclusive that there is only one union representation to employees in a certain bargaining unit.[1] In return, this exclusive union is responsible to represent all employees in it. Second, the differential of the role of labor unions across countries refers to the different union centralization. Among Nordic countries (e.g. Sweden, Norway, and Finland), labor unions are centralized in both industry level and country level. Employees are represented by a labor union in each industry and they share a national union confederation in a country. These unions have strong bargaining power and cover the majority of employees in these countries. However, there are few chances of industry-level collective bargaining in the United States. Most bargaining activities occur in firm-level, which means that they rarely affect the whole industry or the country. Third, employees have the right to vote for union representatives in corporate boards among a majority of OECD countries and European Union members.[2] For example, in Finland, a company with more than 150 employees is required to have one fifth of board members if there is no representation agreement with employees.[3] For another example, in Germany, representation proportion in supervisory board is one third in companies with more than 500 workers. If a company employs more than 2000 workers, the representation proportion in board must be no less than 50%. But in most industries, the chair of the board is shareholder representative and has the casting vote (McGaughey, 2016).[4] Moreover, in some countries (e.g. Czech Republic, Greece, Ireland, etc.), this law-guaranteed board representation is only valid in state owned companies. Labor unions in these 35 countries

[1] See National Labor Relations Act.
[2] There are 20 countries that have some form of corporate law protecting the voting right of workers in board level, especially in state-owned companies, they are: Austria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, and Sweden. In addition, there are 7 countries with certain regulations related to the right of workers to have their voices heard in board level. These countries include Belgium, Bulgaria, Malta, Romania, Switzerland, United Kingdom and United States.
[3] See the 1990 Act on Personnel Representation in the Administration of Undertakings.
[4] See the One-third Participation Act 2003, Codetermination Act 1976.

have strong power to affect firms' activities from corporate boards. Overall, labor unions have some country-specific differential in the function of representing employees and protecting employees' benefits across countries.

The variation of the function of labor unions across countries is affected by different labor policies in countries under different legal systems. In Europe, for example, the different regulatory traditions among countries influence the labor policies and shape the content of industry relations in these countries (Hall, 1994). Moreover, in European Community, there are different legal traditions and have developed three main legal systems among states members.[5] The first legal system is the Romano-Germanic system[6] which covers most countries in European Community. There is intensive legal protection of employees and industry relations. For example, in Germany, the participation degree of employees to the corporate board is high due to the statutory support. In addition, employees have full voting rights in the union elections. The second one is the Anglo-Irish system which is developed from the Anglo-Saxon law and covering the United Kingdom and Ireland. The statutory regulations for employees are less intensive compared with it in Roman-Germanic system. For example, the employee codetermination in corporate board are not compulsory except in universities in United Kingdom.[7] The third legal system is the Nordic system that covers five Nordic countries, namely Denmark, Finland, Iceland, Norway. In this legal system, the derogation of labor legislation is allowed by national federations and this situation is normal. Instead, the basis of labor regulations is the collective agreements. Labor unions play a very important role in these countries because they have strong bargaining power in agreements negotiations.

Therefore, combined with union density in Visser (2006), the country-level union density may be affected by the legal system. The more intensive legal system is associated with lower

[5] See European Confederation of Executives and Managerial Staff (CEC) 1989: 8-12.
[6] The Roman-Germanic law sometimes refers to as the continental law.
[7] See Oxford University Act 1854, Cambridge University Act 1856, etc.

country-level union density. For example, the three countries with highest union density, namely Finland, Norway and Denmark, are in the Nordic system where the labor statutory are based on the collective agreements. However, the union density in Roman-Germanic countries (e.g. France, Germany) with intensive statutory regulations is quite low. Given various legal systems around the world, it is meaningful to conduct further analysis on how labor unions affect corporate financial policies in international settings.

In this thesis, I examine how the presence of labor unions affects financial policies in the international setting, including the corporate cash holdings, dividends and share repurchases. This thesis is motived from the following three perspectives: First, corporate cash holdings, dividends and share repurchases are three essential financial policies for a firm around the world. For example, Pinkowitz, Stulz and Williamson (2013) find that in 2010 the mean of the ratio of cash to assets is 13.49% for firms in Compustat across 45 countries. Given such a large magnitude of corporate cash holdings, firms may take some strategies such as dividend payments and share repurchase to reduce the available financial resources to gain bargaining positions with labor unions around the world.

Second, most previous papers use US data to investigate how labor unions impact firms' financial policies. However, to our knowledge, no previous paper studies the relation between labor unions and these three financial policies with international data. Labor unions are a prevalent international phenomenon. According to Visser (2006), union density of United States ranks 22nd among the 24 countries. If we think of the distribution of union density around the world as a spectrum, the United States is at the lower end. It is meaningful to study how labor unions affect corporate cash holdings, dividends and share repurchases in the middle part and higher end of the spectrum. Besides, the function of labor unions varies across countries under different labor policies. This variation of the function of labor unions across countries is affected by the different labor policies in countries under different legal systems.

Given various legal systems around the world, it is meaningful to conduct further analysis on how labor unions affect corporate financial policies in international settings.

Third, the findings in the existing literature using US data and international data find different patterns in the impact of labor unions on corporate financial policy. For example, Matsa (2010) uses the US data and finds that there is a positive relation between the strength of labor unions and leverage with the presence of external financial constraints, and he interprets the results as the supporting evidence for the bargaining hypothesis. However, Simintzi, Vig and Volpin (2015) find the opposite results with the international data. They find that there is a negative relation between union density and leverage, and argue that this is not consistent with the theory of debt as a bargaining tool. Instead, they argue that the employment protection increases operating leverage and crowds out financial leverage. Therefore, it is possible that the impacts of labor unions on corporate financial policies are different between the US data and the international data. This motivates us to examine the relation between labor unions and the three financial policies in the international setting.

1.2 Contribution and Empirical Results

This thesis makes several contributions by studying how labor unions affect corporate financial policies including corporate cash holdings, dividends and share repurchases in international settings.

First, existed papers show that there are mixed results of the study about the relation between labor unions and corporate financial policies. For example, Matsa (2010) and Simintzi, Vig and Volpin (2015) find opposite results of the relation between labor unions and leverage by using US data and international data separately. For another example, Chen, Chen, and Wang (2015) and He, Tian and Yang (2016) find negative relation between labor unions and share repurchases, while Chino (2016) argue that the effects of labor unions on payout police are negative for low-profitability firms and positive for high-profitability firms. This thesis

reveals a negative relation between labor unions and corporate cash holdings, as well as a positive relation between labor unions and payout policy with international data.

Second, this thesis contributes to the literature about corporate cash holdings, dividends and share repurchases in international setting. There are extensive literatures studying these three financial policies with US data, European data and international data. For example, Opler, Pinkowitz, Stulz, and Williamson (1999) use US data and propose the trade-off theory, the financing hierarchy theory and the agency theory of corporate cash holdings. Moreover, Eije and Megginson (2008) show that although fewer firms pay dividends, the amount of dividends payout increases in recent years by using the European data. With the international data, Manconi, Peyer and Vermaelen (2014) find that the short-term announcement return of share repurchases is smaller in non-US firms while the long-term abnormal return is larger in 32 countries. To our knowledge, no previous paper has examined the relation between labor unions and these three financial policies in the international setting. This thesis extends the literature about the impact of labor unions on corporate finance in the international setting.

Third, this thesis extends the literature about the effects of labor unions in the area of corporate finance in the international setting. Since most papers focus on the US data, the union membership in US is at the lower end of the spectrum of union membership. In this case, using international data provides an extension to the impacts of labor unions on corporate cash holdings, dividends and share repurchases in the middle part and higher end of the spectrum. It provides more comprehensive evidence based on a more complete distribution of union density around the world.[8]

This thesis finds the following empirical results by using a sample of 355715 firm-year observations from 66 countries from 1992 to 2013.

[8] See Figure 2-1 for the spectrum of average union membership around the world between 1992 and 2013.

Chapter 2, “Labor Unions and Corporate Cash Holdings: Evidence from International data”, is a joint work by Dr. Zhenxu Tong. He proposes the original research topic and contributes to the development of hypotheses and research design. I conduct the empirical analysis, draw the interpretation of the empirical results and link them with the rationale of the hypotheses. We find that a one standard deviation increase in the country-level union membership leads to a 0.317 decrease in corporate cash holdings, corresponding to a decrease in corporate cash holdings with a dollar value of 55.40 million dollars. Moreover, we find that this negative relation between country-level union membership and corporate cash holdings is stronger for firms in countries with weaker employment protection legislation, for firms in countries with a higher degree of labor bargaining centralization, and for financially constrained firms. In addition, we find that the market value of corporate cash holdings is lower for firms in countries with higher union membership. Then, we examine how labor unions affect the relation between corporate cash holdings and profitability as well as labor costs. We find that the positive relation between corporate cash holdings and operating profitability is stronger for firms in countries with lower union membership and that the positive relation between corporate cash holdings and labor costs is weaker for firms in countries with lower union membership.

Chapter 3, "Labor Unions and Dividend Payouts: Evidence from International Data", is a joint work by Dr. Zhenxu Tong. He proposes the original research topic and contributes to the development of hypotheses and research design. I participate in the further development of the research topic. I also propose some additional hypothesis and some additional research design. I conduct the empirical analysis and interpret the results with respect to the rationale of the hypotheses. We examine how the presence of labor unions affects firms' dividend payout. When there is higher union membership in a country, firms tend to pay more dividends. A one standard deviation increase in the country-level union membership leads to a 0.019 increase in

the level of dividend payout, corresponding with an increase in dividends payout with a dollar value of 3.033 million dollars. In addition, we find that the positive relation between country-level union membership and dividend payout is stronger for firms in countries with weaker employment protection legislation and firms in countries with a higher degree of labor bargaining centralization. We conduct event study about how the country-level union membership affects the around the date of dividend change. We find that the announcement return is higher (lower) for firms in a country with higher (lower) union membership around the announcement date of dividend increase (decrease). Moreover, we examine how labor unions affect the operating performance around the event of dividend changes. We find that the net ROA change is positively (negatively) correlated with the union membership around the event date of dividend increase (decrease).

Chapter 4, "Labor Unions and Share Repurchases: Evidence from International Data", is a single-authored paper. I examine how the presence of labor unions affects firms' share repurchases. When there is higher union membership in a country, firms tend to repurchase more shares. A one standard deviation increase in the country-level union membership leads to a 0.010 increase in the level of share repurchases, corresponding with an increase in share repurchases with a dollar value of 1.600 million dollars. In addition, I find that the positive relation between country-level union membership and share repurchases is stronger for firms in countries with weaker employment protection legislation and firms in countries with a higher degree of labor bargaining centralization. Moreover, in the event study, I find that the announcement return is higher for firms in a country with higher union membership around the announcement date of share repurchases, while the net ROA change is positively correlated with the union membership around the event date of share repurchases.

1.3 Organization of This Thesis

This thesis is organized as follows, Chapter 2, Chapter 3 and Chapter 4 present the empirical studies. Chapter 5 discuss the limitations, future work, and concludes the paper.

Chapter 2 Labor Unions and Corporate Cash Holdings: Evidence from International data

2.1 Introduction

Corporate cash holdings occupy an important role in the collective bargaining with labor unions around the world. For example, in the United States in 2006, the workers in General Motors observed that the firm had a cash balance of $20 billion and claimed that "they hope the threat of a strike will prompt GM's management to dip into its cash reserves to compensate them for accepting lower pay and benefits"[9]. As another example, in South Africa in 2016, the labor unions in wage negotiations with South African Airlines (SAA) said that they "had revised upwards their wage demands from single digits to 11%, after the airline's board chair Dudu Myeni said on Friday SAA was financially sound and 'had money'". After that, SAA "moved to distance itself from perceptions it had sufficient cash to meet high wage demands".[10] Combined with the example in South Africa Airlines, it is meaningful to do research on this international phenomenon.

In this chapter, we examine how the presence of labor unions affects corporate cash holdings in an international setting. Our motivation is based on the following three perspectives. First, corporate cash holdings have an important role in a firm's balance sheet around the world. For example, Pinkowitz, Stulz and Williamson (2013) find that in 2010 the mean of the ratio of cash to assets is 13.49% for the firms in Compustat in 45 countries, and that the

9 "Last Tango in Detroit? General Motors, Delphi and the Unions," The Economist (April 2006), p. 70. The article is available at the following website when we write the first draft of this article: https://www.economist.com/business/2006/04/06/last-tango-in-detroit. A PDF copy of the article is available from the authors upon request.

10 Karl Gernetzky, "SAA denies wage deadlock during negotiations", Times LIVE, (May 12, 2016). The article is available at the following website when we write the first draft of this article: http://www.timeslive.co.za/local/2016/05/12/SAA-denies-wage-deadlock-during-negotiations. A PDF copy of the article is also available from the authors upon request.

corresponding mean is 21.48% for US firms. Given such a large magnitude of corporate cash holdings, we believe that it is a promising area to examine the impact of labor unions on corporate financial policy in the international setting.

Second, while labor union is a prevalent phenomenon around the world, there is substantial difference between US and other countries in the world. For example, Visser (2006) examines the data of labor unions in the international setting. He finds that in 2001 the union density ranges from 8.1% to 78.0% in 24 countries. Among them, the union density in the US is 12.8%, ranking at the 22nd place. It implies that there is a significant difference between the US data and the international data in terms of unionization rates. This motivates us to conduct the research in the international setting.

Third, the findings in the existing literature reveal that sometimes there is a different pattern in the impact of labor unions on corporate financial policy between US data and international data. For example, Matsa (2010) finds that a firm with the external finance constraints has an incentive to use the cash flow demands of debt service to improve its bargaining position with workers. However, Simintzi, Vig and Volpin (2015) find that there is a negative relation between union density and leverage, and argue that this is not consistent with the theory of debt as a bargaining tool. Instead, they argue that the employment protection increases operating leverage, crowding out financial leverage. Nevertheless, the situation may be different in the setting of corporate cash holdings. For instance, the two examples we mentioned in the beginning of the paper imply that corporate cash holdings affect the collective bargaining both in the US and in South Africa. Therefore, we conjecture that corporate cash holdings may have a bargaining role both in the US and in other countries in the world. This motivates us to examine the impact of labor unions on corporate cash holdings in the international setting.

We develop two hypotheses. First, the bargaining hypothesis argues that with the presence of stronger labor unions, a firm will strategically hold lower level of corporate cash holdings to increase a firm's bargaining position with labor unions, because this can make a more credible case that the risk of liquidity shortages would be exacerbated by granting additional concessions to the labor unions. Second, the operating leverage hypothesis argues that since stronger labor unions increase the rigidity of labor costs, the trade-off theory predicts that a firm will hold a higher level of corporate cash holdings with the presence of a higher level of fixed costs.

We use a sample of 355715 firm-year observations from 66 countries in our empirical analysis. We use the country-level union membership, defined as total number of trade union members to the total number of paid employees in a country, as our primary measure of the bargaining power of labor unions across countries. Since endogeneity problem can be a potential concern in studying the relation between union membership and corporate cash holdings, we use the instrumental variables approach accompanied with the tests on the validity of the instruments and the specification.

We find that firms in countries with higher union membership have less corporate cash holdings. The data shows that a one standard deviation increase in the country-level union membership leads to a 0.317 decrease in corporate cash holdings which are defined as the ratio of cash and marketable securities to non-cash assets. This corresponds to a decrease in corporate cash holdings with a dollar value of 55.40 million dollars. We divide the firms into sub-groups based on the characteristics that can affect the bargaining power of labor unions. We find that this negative relation between country-level union membership and corporate cash holdings is stronger for firms in countries with weaker employment protection legislation, for firms in countries with a higher degree of labor bargaining centralization, and for financially constrained firms.

To better understand the negative relation between country-level union membership and corporate cash holdings, we proceed to examine how labor unions affect the market value of corporate cash holdings. We find that the market value of corporate cash holdings is lower for firms in countries with higher union membership. Moreover, we examine how labor unions affect the relation between corporate cash holdings and profitability as well as labor costs. We find that the positive relation between corporate cash holdings and operating profitability is stronger for firms in countries with lower union membership, and that the positive relation between corporate cash holdings and labor costs is weaker for firms in countries with lower union membership.

Our findings are consistent with the bargaining hypothesis, and we conclude that firms strategically choose corporate cash holdings to gain the bargaining position with labor in the international setting.

Our paper makes several contributions. First, we contribute to the literature by finding out the difference in the role of bargaining between cash and leverage in terms of the comparison between US and international data. Both cash (e.g. Klasa, Maxwell and Ortiz-Molina, 2009) and leverage (Matsa, 2010) have been found as an effective bargaining tool in the studies that use US data. However, Simintzi, Vig and Volpin (2015) argue that leverage is not regarded as a bargaining tool in the international data. Nevertheless, the situation is different in the setting of corporate cash holdings because we find that corporate cash holdings have an important role for bargaining in the international data. Therefore, if we take our paper and Klasa, Maxwell and Ortiz-Molina (2009) as a pair, and take Simintzi, Vig and Volpin (2015) and Matsa (2010) as another pair, the comparison between the two pairs reveal that cash and leverage play different roles in the collective bargaining between US data and international data. This has not been documented in the literature.

Broadly speaking, our findings are also consistent with the argument proposed by Opler, Pinkowitz, Stulz, and Williamson (1999) that cash is not negative debt. Opler, Pinkowitz, Stulz, and Williamson (1999) argue that cash is not negative debt from the perspective of trade-off theory.[11] However, our paper reveals a new channel, namely collective bargaining, through which cash is not simply regarded as negative debt based on the study of international data. Therefore, our paper extends Opler et al. (1999) by pointing out a new difference between cash and leverage from the bargaining perspective.

Second, our research extends the literature on corporate cash holdings in the international setting. There is a large literature on corporate cash holdings using both US data[12] and international data. Among the previous papers that use international data, Dittmar, Mahrt-Smith and Servaes (2003) find that the level of corporate cash holdings is determined by the degree of shareholder protection from laws in different countries, and argue that firms with low shareholder protection cannot make managers to disgorge cash. Kalcheva and Lins (2007) find that when external country-level shareholder protection is weak, firm values are lower when controlling managers hold more cash. Lins, Servaes and Tufano (2010) conduct an international survey and find that lines of credit are strongly related to a firm's need for external financing to fund future investment opportunities, and that cash is primarily held as a general buffer against future cash flow shortfalls. To our knowledge, no previous paper has examined the relation between labor unions and corporate cash holdings in the international setting.

[11] Opler et al. (1999, p. 8) state that "for a given amount of net debt, there is an optimal amount of cash, and cash is not simply negative debt".

[12] Among the previous papers that use the US data, for example, Opler, Pinkowitz, Stulz and Williamson (1999) argue that corporate cash holdings can be explained by the tradeoff theory, the financing hierarchy theory and the agency theory. Harford (1999) finds that cash-rich firms are more likely to make value-decreasing acquisitions. Mikkelson and Partch (2003) find that firms with persistent high cash holdings do not have lower operating performances, and argue that the findings do not support the free cash flow hypothesis. Dittmar and Mahrt-Smith (2007) find that corporate charters of takeover defences and institutional ownership affect the value of corporate cash holdings.

Third, we add to the literature on the impact of labor unions on corporate finance in the international setting. There is growing literature that examines the impact of labor unions on corporate finance. Many papers in this literature use the US data. For example, previous papers have focuses on the impact of labor unions on leverage (e.g., Bronars and Deere, 1991; Hanka, 1998; Matsa, 2010), earnings management (e.g., DeAngelo and DeAngelo, 1991; D'Souza, Jacob, and Ramesh, 2001), and the cost of equity (e.g., Chen, Kacperczyk, and Ortiz-Molina, 2011). Moreover, Agrawal (2012) finds that labor union pension funds have preferences that partly reflect union worker interests rather than equity value maximization alone. Lee and Mas (2012) find a negative impact of union elections on firm performance. Among the papers that use international data, Atanassov and Kim (2009) documents the importance of interaction among management, labor, and investors in shaping corporate governance. They find that strong union laws protect not only workers but also underperforming managers. Therefore, our research extends the literature by studying the impact of labor unions on corporate cash holdings in the international setting.

This chapter is organized as follows. Section 2.2 review the literature. Section 2.3 develops the hypotheses. Section 2.4 describes the data and the variables. Section 2.5 discusses the methodology. Section 2.6 presents the results. Section 2.7 shows the robustness checks. Section 2.8 concludes this chapter.

2.2 Literature Review

This section reviews the literature about labor unions and corporate financial policies and the literature about the corporate cash holdings.

2.2.1 The literature about labor unions and corporate financial policies

There are various literature studying the relation between labor unions and corporate financial policies in both theoretically and empirically.

2.2.1.1 Labor unions and corporate productivity

Early literature suggests that the presence of labor unions increase firms' productivity in labor economics.

For example, Clark (1980) finds that unionization increases the productivity of workers in a firm in his case study of the US cement industry. He explains that this higher productivity comes from the efforts of labor unions who improve the management procedures and labor quality in that firm. Allen (1984) finds evidence supporting the positive impacts of labor unions on firms' productivity in the US office and school contractors. They argue that labor unions offer more training and hiring opportunities to employees whose majority are short-term workers and conclude that labor unions increase firms' productivity.

Despite the positive relation between labor unions and firms' productivity, Allen (1988) extends his research by studying the productivity change. He finds that labor unions have no impact on the productivity growth in manufacture industry while having negative impacts on productivity growth in the construction industry. Furthermore, Abowd (1989) shows that higher productivity from labor unions cannot affect firms' market value. He argues that the positive effects of firms' productivity from labor unions are offset by the negative effects of higher wage demands in collective bargaining.

2.2.1.2 Labor unions and bargaining

Previous literature study the labor unions from bargaining perspective in two lines. The first line is based on the union monopoly model which is proposed by Leontief (1946), the wage was set by labor unions before the level of employment is set by firms. Subsequently, McDonald and Solow (1981) describe labor unions as the monopoly seller of labor resources selecting the best wage point on firms' employment demand curve. Although various labor economists tried to improve this model (e.g., Fellner, 1947, Cartter, 1959 and Oswald, 1982).

This model is inefficient because it is not Pareto efficient[13]. The second line is McLaughlin and Fraser (1984) theoretically discuss the role that labor unions played in collective bargaining and argue that the labor unions represent employees' benefits and strengthen their' bargaining power to both employers and shareholders. Moreover, Lewis (1986) presents empirical research to examine the difference of wage of unionized and non-unionized workers in the US between 1967 and 1979. He finds empirical evidence that labor unions increase the salaries of workers because labor unions increase workers' bargaining power leading to higher wages and more capital costs in collective bargaining. Freeman (1986) shows that management will take measures to prevent the organizing of labor unions. The higher differential in employees' wages in unionized firms and nonunionized firms, the more opposition from firms' management, these effects are even stronger than the workers' desire for unionization.

Besides, financial economists find more evidence that this stronger bargaining power from labor unions has effects on firms' various financial policies.

2.2.1.3 Labor unions affect corporate financial policies

Labor unions affect firms' leverage. Bronars and Deere (1991) argue that by issuing debt, firms credibly reduce the funds that are available to a potential union when bankruptcy is costly. They show that there is a cooperative Nash solution where the union will moderate its demand in the face of outstanding debt and that there is a negative relation between the union wage and debt. Dasgupta and Sengupta (1993) investigate in firms in the electric utility industry in the US between 1972 and 1983 and examine the probability of debt financing for a firm before collective bargaining with labor unions. They predict that unionized firms in this industry are more likely to choose a higher level of debt to gain bargaining power in the negotiations with labor unions. A contemporaneous paper on firms' leverage is Perotti and Spier (1993), they

[13] See survey paper Lawson (2011) for further discussion.

theoretically analyze the strategical use of capital structure in dynamic conflicts between shareholders and other stakeholders, such as creditors, employees and so on. They find that the firms exchange junior debt for equity when there is insufficient profit to pay the wages of employees and when there are new NPV projects. They argue that the firms use temporarily high leverage as a bargaining tool with labor unions in negotiations because firms threat unions that they cannot finance new profitable projects unless labor unions compromise wage concessions. Recently, Matsa (2010) examines the relation of debt financing and labor unions in both firm-level and state-level data in the US. He finds that firms with external finance constraints use the cash flow demands of debt service to reduce the internal liquidity available for wage demands from labor unions. He emphasizes that these firms choose debt financing as a strategy to increase their bargaining position in collective bargaining with labor unions. Moreover, Myers and Saretto (2015) examine the relation between labor unions and corporate leverage in contract negotiations in the US. They find that the likelihood of strikes organized by labor unions before contract negotiations are lower in firms who have a higher level of corporate leverage, because that the higher leverage is associated with stronger bargaining power in negotiations with labor unions.

Labor unions also have influences on firms' cost of capital. On one hand, labor unions increase firms' cost of equity, for example, Chen, Kacperczyk and Ortiz-Molina (2011) examine the effects of labor unions on firms' cost of equity with American data. They show a positive relation between the cost of equity and the industry level of unionization, because the labor unions decrease firms' operating flexibility. On the other hand, labor unions increase firms' cost of debt, for example, Qiu and Shen (2017) examine how labor unions affect the cost of bank loan and find a causal relation by using the election data in the US from 1988 to 2009. They find that the bank loan spread increases when labor unions win elections in a firm, because labor unions increase the recovery rate of creditors in bankruptcy procedures. In addition, Chen,

Kacperczyk and Oritz-Molina (2011, b) examine the relation between labor unions and firms' bond yields in the US and find that the higher level of unionization in an industry leads to lower corporate bond yields. They argue that labor unions reduce firms' risky investments and the likelihood of acquisition to decrease the bond risks.

There is some literature about labor unions and earnings management. Reynolds (1978) state that a firm's union leader will increase wage demands when firms report good financial conditions and will accept current wage when firms in poor business situations. Liberty and Zimmerman (1986) use a small sample with 105 unionized firms to test the negative effects of labor unions on firms' reported earnings around labor negotiations. However, they find modest evidence that firms have less incentive to reduce earnings for labor negotiations. Moreover, DeAngelo and DeAngelo (1991) investigate in firms in steel production industry in the US and find that firms take various measures to manage their earnings, such as lower income reporting, dividend reductions and so on during negotiations with labor unions. As a result, firms increase their bargaining power and gain more concessions in collective bargaining with labor unions.

Some literature suggests that labor unions affect corporate investments. Hirsch and Link (1987) study the relation between labor unions and firms' innovation in 315 manufacturing firms located in central New York State. They find labor unions have negative impacts on firms R&D expenditure and reduce future performance. Moreover, Fallick and Hassett (1991) exploit the level of corporate investment in the year following the election of union certification. They find the win in union certification election reduces corporate investment, but they provide no explanation about these results. Recently, Bradley, Kim and Tian (2016) examine the relation between unionization and firms' innovation with a regression discontinuity design. Firms reduce the R&D expenditures when they experience a passing in union election. This reduction leads to an 8.7% patent quantity decrease in the following three years.

The presence of labor unions decreases firms' performance. Earlier research suggests positive effects of labor unions on firms' profitability and argues that the effects come from the higher productivity in unionized firms (e.g., Clark, 1980 and Allen, 1984). More research proves that the positive effects are offset by the higher wage demands collective bargaining between firms and labor unions (e.g., Abowd, 1989). Ruback and Zimmerman (1984) compare the abnormal monthly return for the month of union elections and for the month of results outcome which published by the National Labor Relation Board. They find significant negative impacts from labor unions on firms' equity value in 253 the US-listed firms. In addition, Connolly, Hirsh and Hirschey (1986) argue that more unionized firms have a lower return on R & D investments. They conclude that labor unions reduce firms' profitability and market value by reducing the intangible capital investment. Hirsh (1991) develops a union rent-seeking model and find labor unions are negatively associated with firms' profitability and market value. He shows that extensively unionized firms turn to invest in intangible capital rather than long-lived capital across industries in the US. Bronars and Deere (1993) find the manufacturing firms grow less when union elections win. However, they argue that the negative effects of labor unions on firms' market value are not related to the growth changes and the effects cannot explain the equity losses from unionization perspective. Lee and Mas (2012) examine the long-run impacts of union elections on equity value by using event study in the US-listed firms. They find that union election win decreases the market value in the following 15 to 18 months. More recently, Marciukaityte(2018) finds that stock performance of unionized firms in states without right-to-work laws is poor, due to the higher labor costs. There are also some literature studies the effects of labor unions on corporate cash holdings, dividend payouts and share repurchase, but the predictions are conflict or weak.

Early literature finds little support for the line that labor unions affect firms' mergers and acquisitions by using small samples. For example, Rosett (1990) studies the union wealth

concessions after acquisitions in 258 takeovers and compares the union wealth change with real wage growth. He finds modest evidence that acquiring firms gain shareholder wealth from union wealth concessions of target firms and it is more severe in hostile takeovers. For another example, Garvey and Gaston (1997) examine the effects of firms' financial and employment contracts on hostile takeovers in 369 the US firms in 1984 and find modest evidence that labor unions lower the cost barriers to hostile takeovers. Because the presence of labor unions increases the bargaining power of employees so that firms reduce their investments to precaution the wage demands and employment growth and become more vulnerable in a hostile takeover. Recently, more empirical research reveals that the presence of labor unions increases employees' bargaining power and affect firms' mergers and acquisition activities. For example, John, Knyazeva and Knyazeva (2015) find that the negative effects of labor rights on the announcement return of acquiring firms are larger in an industry with higher unionization rate. Because firms need to negotiate with labor unions about labor force restructuring, wage and other contract conditions. For another example, Tian and Wang (2016) show target firms are less likely to receive takeover bids when they pass the union elections than firms who fail in the union elections. These firms also experience longer bid durations and receive lower bid premiums when they become targets. Moreover, Chen, Chen and Chen (2018) study the payment method in the US domestic acquisition between 1990 and 2012. They find acquiring firms prefer to cash payment when there are labor unions. They argue that cash payments reduce firms' liquidity so that firms gain a better bargaining position with labor unions.

Financial economists apply to labor unions in their study of corporate payout policies. In terms of corporate dividend payments, for example, Ramirez (2004) studies how labor unions affect the signaling effects of corporate dividend payments. Since firms pay out dividends to signal future profits to investors, this signal also inspires labor unions to increase wage demands. He finds the signaling effects are stronger in firms without labor unions than it in unionized

firms and that leads to different markets responses. For another example, Addessia and Busatob (2009) examine the effects of labor unions' preference between wage and employment demands on firms' asset returns. They find that when labor unions claim the fair wage based on the firms' dividend policies, the volatility of corporate asset returns increases. Chino (2016) finds that firms with higher profitability has a higher payout with the presence of strong labor unions and argues that this is consistent with the rent extraction hypothesis that firms use payout policies to reduce the rent extracted by potential collective bargaining of labor unions. In terms of share repurchases, Chen, Chen and Wang (2015) examine the relation between the firms' share repurchases and unionization in the US and find a negative relation. They argue that firms are less likely to repurchase shares with the presence of stronger labor unions because labor unions will get tougher after firms repurchase shares, which weakens firms' bargaining positions.

Labor unions decrease corporate cash holdings. Klasa, Maxwell and Ortiz-Molina (2009) apply the bargaining effects of labor unions to their studies about corporate cash holdings by using the US data. They argue that firms hold fewer cash holdings to improve their bargaining positions against labor unions, because firms can claim liquidity shortages and gain more concessions to the labor unions in collective bargaining. As a result, a firm will strategically hold less cash to increase its bargaining position with labor unions.

Labor unions impact firms' bankruptcy procedures. For example, Dawson (2015) study the role of labor unions played in corporate bankruptcy in the US. He finds that labor unions decrease the recovery rate of creditors and help firms' management to prevent asset sales in bankruptcy, because labor unions also afraid of bankruptcy costs. Furthermore, Campello, Gao, Qiu and Zhang (2017) investigate the effects of labor unions on corporate bankruptcy procedures with the data of union elections in the US. They show that unionization increases

the difficulty, the costs and the period of bankruptcy procedures, and decrease bondholders' recovery value.

However, labor economists find evidence that the RTW laws lower the demands of union representation. For example, Ellwood and Fine (1987) state that RTW laws impact the organizing of labor unions and decrease the attraction because RTW laws provide economic benefits similar to labor unions. They demonstrate 5%-10% decrease of union membership across states in the US due to the passage of RTW laws. Recent research about the bargaining effects of labor unions on corporate financial policies finds that the positive effects are weaker when they include the right-to-work (RTW) laws in their study. For example, Matsa (2010) suggests that corporate leverage in unionized industries are lower after the passage of RTW laws in the 1950s and 1960s. More recently, Marcjukaityte (2015) compare the positive effects of labor unions on firms' leverage in states with right-to-work (RTW) laws and states without RTW laws in the US. He shows that the positive effects are stronger in firms that located in states without RTW laws than firms that located in states with RTW laws, because labor unions in states without RTW laws are more powerful, corresponding with higher bargaining power of labor unions.

Labor unions exist all around the world. Most papers have focuses on the impact of labor unions on firms' financial policies in the US. However, Visser (2006)shows that the union density in 2001 ranges from 8.1% to 78.0% in 24 countries. This data in the US is only 12.8%, ranking 22nd in his sample. The difference of unionization across countries motives financial economists to study the relation between labor unions and financial policies in the international settings. Among the papers that use international data, Atanassov and Kim (2009) documents the importance of interaction among management, labor, and investors in shaping corporate governance. They find that the strong union laws protect not only workers but also underperforming managers.

More recently, a growing number of literature study the role of corporate cash holdings in more diverse areas such as productive market competition, culture, non-financial stakeholders and so on.

Recently, financial economists connect labor unions to more objectives in the literature of corporate finance. For example, Agrawal (2012) focuses on proxy votes in union pension funds. He exploits the change of union pension funds and finds union pension funds pursue employees' interest rather than shareholder wealth. Moreover, Huang, Jiang, Lie and Que (2017) examine the effects of labor unions on CEO compensation in the US with a sample period of 1993-2011. They find that firms decrease the chief executive officers' compensation when there are strong labor unions who threaten managers with possible strikes. In addition, Chun and Shin (2018) link labor unions to corporate social responsibility in Korea. They find labor unions force firms decrease the expenditure in corporate social responsibility activates to compensate employees' benefits.

2.2.1.4 Labor unions and agency problems

Labor unions try to raise their wages and other benefits through collective bargaining. However, investors want to maximize firms' profits and avoid these costs. This conflict always exists in a firm. As a result, both shareholders and labor unions try to influence managers' decision-making process. When investors have a greater influence, managers will give priority to capital value gain. When labor unions have a greater influence, managers have to increase employee's welfare before value enhancement (Tirole, 2001). Both the relations between investors and managers, as well as the relation between labor unions and managers are documented in previous literature. In terms of the relation between investors, previous literature finds that there are agency problems between shareholders and managers which lead to overinvestment problems. For example, Jensen (1986) develops the free cash flow hypothesis about the agency problems and he argues that the surplus after financing profitable projects

becomes free cash flow. These free cash flows can be used to satisfy managers' own benefits and lead to overinvestment problems (e.g. Harford, 1999; Bates, 2005) Harford, Mansi and Maxwell (2007) find firms with higher shareholder rights decrease the capital expenditures and acquisitions, thus reduce agency costs. In terms of the relation between labor unions and managers, labor unions affect firms' activities through bargaining which is discussed in Section 2.2.1.2.

In terms of the relation between labor unions and investors, previous literature discusses about the relation from two opposite sides. Quite a lot literature emphasizes the negative effect of labor unions on firms' operations and shareholder value (e.g. Hirsch, 1991; Baldwin,1983; Chen, Kacperczyk and Ortiz-Molina, 2011).

However, some literature supports the positive effect of labor unions on operations of companies, because labor unions reduces the agency costs. On one hand, labor unions play a monitoring role to protect their long-term benefits and job security. For example, Leung at al. (2010) state that firms with labor unions increases the accounting conservatism because labor unions demand the accounting conservatism to protect themselves from managerial misbehavior. The accounting conservatism is associated with a higher level of verification before firms report profits, that is used to monitor managers behaviors (Watts, 2003). For another example, Gomez and Tzioumis (2006) find that labor unions decrease the CEO compensations which is one of sources of the agency costs. In addition, Faleye, Mehrotra and Morck (2009) find that labor unions monitor firms' cash flows to make sure that firms have enough money to pay their wages. They also point out that labor unions have a corporate governance voice that they prevent managers from investing in risky projects. On the other hand, firms decrease their liquidity and increase leverage to against the bargaining power of labor unions (e.g. Klasa, Maxwell and Ortiz-Molina, 2009; Matsa, 2010; Myers and Saretto,

2015). From this aspect, the presence of labor unions reduces the free cash flow, that lower the agency costs.

2.2.2 The literature about corporate cash holdings

The literature about corporate cash holdings starts from Keynes (1936). He documents that holding cash can reduce firms' transaction costs when making payments, and it is a buffer to future uncertainty. Recent literature shows that firms hold a large amount of corporate cash holdings. For example, Bates, Kahle and Stulz (2009) find that the ratio of cash to assets in the US industrial firms increases from 10.5% in 1980 to 23.2% in 2006. In worldwide, Kalcheva and Lins (2007) state that the average proportion of cash or cash equivalents in total assets is 16% among 5000 firms from 31 countries.

Several papers develop several reasons why firms hold so much cash. Opler, Pinkowitz, Stulz, and Williamson (1999) propose three theories about corporate cash holdings. First, the tradeoff theory predicts that there is an optimal level of cash, and that firms trade off both the benefits and the costs of holding cash by choosing the level of cash where the marginal benefits equal to the marginal costs. Second, the financing hierarchy theory predicts that there is not an optimal level of cash, and that firms choose the financing method based on the pecking order among cash, debt and equity. Third, the agency theory predicts that with the presence of agency problem between managers and shareholders, managers will use cash in a discretionary way to realize their self-interests. Opler, Pinkowitz, Stulz, and Williamson (1999) find evidence supporting the tradeoff theory of corporate cash holdings by using data listed the US firms between 1971 and 1994. For example, they find firms hold a higher level of cash to total non-cash assets when they have strong growth opportunities and riskier cash flows. Moreover, they find some evidence that supports the financing hierarchy theory. For example, they find that firms keep a certain level of cash so that they can still finance projects when the firms are in the situation that external funds are more costly and internal cash flow is lower. In addition,

they do not find evidence to support the agency theory by using one-year data about agency costs in 1994.

2.2.2.1 Tradeoff theory

Some literature supports the tradeoff theory.

Early papers try to find an optimal level of cash in a firm in two main lines. The first line is proposed by Baumol (1952). He argues that the optimal level of cash demand in a firm is determined by the lowest total costs of opportunity and transaction costs, based on the assumption which cash income is stable. Miller and Orr (1966) extend Baumol's model and develop the second line with inventory model. He argues that cash flow is random, and that firms hold cash for transaction costs and precautionary motives.

Recent literature finds empirical evidence supporting the tradeoff theory. For example, Kim, Mauer and Sherman (1998) develop a model by using industrial firms in the US and predict that there is an optimal level of corporate cash holdings. They find that this optimal level is determined by the tradeoff between the lower return of liquid assets and the benefits when a firm needs financing, but external financing is costly. Dittmar, Mahrt-Smith and Servaes (2003) examine the how shareholder protection affects corporate cash holdings and find firms tend to hold more cash when they have higher level of R&D expenditure and higher market-to-book ratio in international data. They argue that both market-to-book ratio and investments can be used as proxies for transaction costs and precautionary motives. They explain that the market-to-book ratio captures the growth opportunities, which is important in transaction motives and reflects the asymmetric information problems.

Ozkan and Ozkan (2004) study the relation between managerial ownership and corporate cash holdings in UK firms. They suggest that firms hold more cash when there are better growth opportunities due to the external financing costs and bankruptcy costs. In addition, Ferreira and Vilela (2004) investigate the cash balances in EMU countries between 1987 and 2000. They

find a positive relation between corporate cash holdings and investment opportunities and argue these results are consistent with the tradeoff theory.

2.2.2.2 Financing hierarchy theory

There is some literature show evidence in financing hierarchy theory.

Different from the tradeoff theory, Myers and Majluf (1984) propose that firms give first preference to internal funds to finance their projects, then external financing.

Several later papers find evidence that there is no optimal level of cash in a firm. For example, Kalcheva and Lins (2003) examine the benefits and costs of cash reserves in firms by using country-level shareholder protection data from 31 countries. They argue that cash is positively related to the growth opportunities, but it is not related to firm value only when country-level shareholder protection is strong. Deloof (2001) also finds evidence in Belgian listed firms when he studies the determinants of liquidity reserves. He finds a negative relation between corporate cash reserves and firms' cash flow and argues that corporate cash reserves play an important role in financing profitable projects according to the pecking order theory. Moreover, Ferreira and Vilela (2004) observe higher cash holdings in firms with lower leverage and argue this is consistent with pecking order theory. Furthermore, D'Mello, Krishnaswai and Larkin (2008) examine the excess cash ratio around the spin-off with similar control variables suggested by tradeoff theory. They find a positive relation between excess cash ratio and firms' cash flow for the sample period from 1985 to 2000. The average corporate cash holdings are lower than that predicted in tradeoff theory. This positive relation and lower level of corporate cash holdings are consistent with financing hierarchy theory. More recently, Lambrecht and Myers (2017) assume that managers are risk averse and study the interaction among firms' debt, investment and payout policy. They argue that under their risk aversion assumption, debts are not stable and depending on firms' profitability. Firms with high profitability decrease the

leverage and reserves more cash as predict by the pecking-order theory because more debts are associated with more risks, while only firms with low profitability prefer debt financing.

2.2.2.3 Agency theory

There is also some literature supports the agency theory.

Jensen and Meckling (1976) have pointed out that there is an agency problem between firms' shareholders and managers. Jensen (1986) argues that the presence of agency problem leads to extra agency costs of free cash flows. Since the free cash flows are essential sources of corporate cash holdings, the agency problem is more severe in firms with more corporate cash holdings. For example, Harford (1999) studies the acquisition activities in firms with a large amount of corporate cash holdings and find that managers tend to maintain more cash than the current amount for investment requirements. However, he argues that the decreases in stock return of acquiring firms predict that the higher level of cash reserves will lead to shareholder wealth loss due to the presence of agency costs.

Dittmar, Mahrt-Smith and Servaes (2003) find evidence to support the agency theory by using international data. They examine firms in 45 countries and find that cash holdings of firms in a country with poor shareholder protection are up to twice of the cash holdings of firms in a country with good shareholder protection. They argue that the findings support the interpretation that managers cannot be forced by shareholders to pay out cash in a country with poor shareholder protection, and that they tend to hold excessive corporate cash holdings. In addition, Dittmar and Mahrt-Smith (2007) compare the value of cash holdings in poorly-governed firms and well-governed firms to test how corporate governance affects firms' value. They find evidence to support agency theory that the value of one dollar of cash in poorly-governed firms is from $0.42 to $0.88, which is lower than the value of cash in well-governed firms. Moreover, Harford, Mansi and Maxwell (2008) study the corporate governance in antitakeover and inside ownership in the US. They find that firms with less entrenched

managers tend to hold more cash, and the excess cash increases capital expenditure and acquisition due to the presence of agency problems.

More recently, Drobetz, Gruninger and Hirschvogl (2010) use the dispersion of analysts' prediction of earnings per share as a proxy of information asymmetry problem to test the effects the financing hierarchy theory and agency theory. They find that the higher level of information asymmetry related to the lower value of corporate cash holdings. Nikolov and Whited (2011) estimate the effects of agency problems on shareholder value with a dynamic model of finance and investment. They show that the typical agency problems lead to 22% increases in corporate cash holdings corresponding with 6% decrease in shareholder value in the US firms. Tong (2011) shows that the firm diversification reduces the value of cash when the level of corporate governance is low by using the methodology of Faulkender and Wang (2006). He argues that this negative impact is caused by agency costs in firms with poor corporate governance. Gao, Harford and Li (2013) compare the cash policies in public and private firms in the US over the period 1995 to 2011. They find the average cash holdings in public firms is about double of that in private firms because the agency problems are severe in public firms. Dudley and Zhang (2016) demonstrate a positive relation between corporate cash holdings and the level of social trust in a country. Due to the agency problems, shareholders tend to push managers to disgorge cash in countries with lower level of social trust.

2.2.2.4 Other literature in more diverse areas

Opler, Pinkowitz, Stulz, and Williamson (1999) identify several factors that impact corporate cash holdings, such as size, leverage, capital expenditure and so on. More recently, a growing number of literature study the role of corporate cash holdings in more diverse areas such as productive market competition, culture, non-financial stakeholders and so on.

Fresard (2010) examine the corporate cash holding in the setting of product market competition. He finds that corporate cash holding improves the firms' performance in product

market. Moreover, he finds that firms with more corporate cash holdings will gain higher future market shares compared with their rivals with less corporate cash holdings.

Chen, Dou, Rhee, Truong and Veeraraghavan (2015) link national culture and corporate cash holdings by studying how the culture dimensions affect the variation of corporate cash holdings across countries and within the United States. They find that corporate cash holdings are negatively related to individualism and positively related to uncertainty-avoidance, and that the precautionary motive for holding cash is affected by both individualism and uncertainty avoidance. They argue that the cultural difference can explain the variation of corporate cash holdings after controlling for the various other factors such as corporate governance and so on.

Gu (2017) find that the multinational firms hold 5.31% more cash than domestic firms in the US with a dynamic model. However, they cannot provide proper interpretation about this difference because of the lack of valid instruments and accurate proxies for some important variables.

In terms of the firms' non-financial stakeholders and corporate cash holdings, Cornell and Shapiro (1987) propose the stakeholder theory and suggest firms' financial policies are affected by the relationship with non-financial stakeholders. Matsa (2010) shows that firms strategically lower the corporate cash holdings to gain bargaining positions with labor unions. Itzkowitz (2013) finds that firms with important relation with their customers hold more cash for precaution motives. He argues that adverse cash flow risks of losing an important customer make firms hold more cash to precaution the additional risks. Ghaly, Dang and Stathopoulos (2015) find that there is a positive relation between firms' commitment to workers' well-being activities and corporate cash holdings by using the employee welfare index. They interpret that firms who take these employee-friendly activities hold more cash to send signals which they have abilities to maintain and improve the employee welfare provisions. As a result, firms gain reputation and send a positive signal to their current and potential workers. Ghaly, Dang and

Stathopoulos (2017) state a positive relation between corporate cash holdings and the percentage of skilled workers in a firm due to the precaution motive. They argue that firms with more skilled workers are more difficult to adjust their labor benefits and have more cash flow risks from labor adjustments. To mitigate the potential adverse cash flow shocks from skilled labor adjustments, firms tend to hold more cash.

2.3 Hypothesis

We develop the hypotheses in this section.

2.3.1 Bargaining hypothesis

There is an extensive literature on the impact of debt on the bargaining between the firm and the labor. For example, (e.g., Baldwin, 1983; Bronars and Deere, 1991; Dasgupta and Sengupta, 1993; Perotti and Spier, 1993; Hanka, 1998; Matsa, 2010). Dasgupta and Sengupta (1993) find unionized firms have more debt to gain bargaining power with labor unions. This literature is built upon the essential rationale that employees will accept a lower level of wage with the presence of a substantial amount of debt, provided that the bankruptcy will be costly for employees. Consequently, a firm can gain the bargaining position with labor by taking on more debts.[14]

Klasa, Maxwell and Ortiz-Molina (2009) apply this reasoning to the area of corporate cash holdings. They argue that firms hold fewer cash holdings to improve their bargaining positions against labor unions because firms can make it a more credible case that the risk of liquidity shortages would even be exacerbated by granting additional concessions to the labor unions. As a result, a firm will strategically hold a lower level of corporate cash holdings to increase its bargaining position with labor. We expect that this mechanism is more likely to

[14] For example, Bronars and Deere (1991) develop a model in which firms use debt to protect the wealth of shareholders from the threat of unionization. By issuing debt, firms can credibly reduce the funds that are available to a potential union when bankruptcy is costly. Bronars and Deere show that there is a cooperative Nash solution where the union will moderate its demand in the face of outstanding debt, and that there is a negative relation between the union wage and debt.

occur with the presence of stronger labor unions because it will be more beneficial for a firm to engage in this kind of strategic choice of corporate cash holdings. Therefore, we have the following hypothesis.

Hypothesis 1: The bargaining hypothesis predicts that there is a negative relation between the strength of labor unions and the level of corporate cash holdings.

2.3.2 Operating leverage

Labor unions make wages more sticky and layoffs more costly. This increases the fixed labor costs, which results in an increase in a firm's operating leverage. For example, Chen, Kacperczyk, and Ortiz-Molina (2011) find that unionization is positively related to various measures of operating leverage. Danthine and Donaldson (2002) argue that fixed labor costs are an important source of operating leverage.

Operating leverage can affect a firm's corporate cash holdings because according to the tradeoff theory of corporate cash holdings, firms hold more cash when there are more expenditures due to the transaction motive. Maure and Traintis (1994) note that the more rigid labor costs and higher operating leverage lead to higher demands of financial flexibility. More recently, Kahl, Lunn and Nilsson (2014) find that firms with higher fixed costs hold more corporate cash holdings.

Linking the two streams of literature together, it implies that there is a positive relation between labor unions and corporate cash holdings through the impact of operating leverage. Similarly, this mechanism is more likely to occur with the presence of stronger labor unions, because the increase in operating leverage will be higher with the presence of stronger labor unions. Therefore, we have the following hypothesis.

Hypothesis 2: The operating leverage hypothesis predicts that there is a positive relation between the strength of labor unions and the level of corporate cash holdings.

2.4 Data and Variables

In this section, we describe the data and variables.

2.4.1 Data

This chapter uses the international data obtained from the following sources. We get the financial data of U.S. firms and Canadian firms from Compustat North America database. We get the financial data of firms in other countries from Compustat Global database. We convert the data in foreign currencies to the corresponding data in U.S. dollars by using the monthly exchange rates from Compustat Global database. We get the country-level data of union membership from ILOStat database maintained by International Labor Organization. The sample period is from 1992 to 2013. The data starts from 1992 because we need to use the data in the prior five years to calculate the industry cash flow volatility, while the data in Compustat Global database starts from 1987. We follow the literature (e.g., Pinkowitz, Stulz and Williamson, 2013) and exclude firms with less than 5 million U.S. dollars in total assets or market capitalization. We also follow the literature and exclude financial firms (SIC codes between 6000 and 6999). We exclude the observations with incomplete data. Our final sample consists of 42777 firms with 355715 firm-year observations from 66 countries.

2.4.2 Variables

2.4.2.1 Union Membership

We use the variable Union Membership as a measure of the country-level bargaining power of labor unions. Union Membership is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. A higher level of Union Membership indicates that the labor unions in a country have higher bargaining power.

2.4.2.2 Corporate Cash Holding

We follow the literature (e.g., Opler, Pinkowitz, Stulz, and Williamson, 1999) and define the variable Corporate Cash Holdings as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities.

2.4.2.3 Control variables

We include the following control variables. We define the variable Size as natural logarithm of non-cash assets. We define the variable Tobin's Q as market value of equity plus non-cash assets minus book value of equity, divided by total assets.[15] Tobin's Q is included to control financial constraints and growth opportunity. We define the variable Leverage as the ratio of long-term debts to non-cash assets. Leverage is included to control capital structure and financial constraints. We define the variable Capital Expenditures as the ratio of capital expenditures to non-cash assets. Capital Expenditures is included to control the investment opportunity. We define the variable Dividends as the ratio of dividends to non-cash assets. Dividends is included to distinguish the effects of firm's dividend payments. We define the variable Cash Flow as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets. Cash Flow is included to control a firm's profitability. We define the variable R&D as the ratio of research and development expenses to non-cash assets. R&D is included to control the potential for financial distress costs. We define the Net Working Capital as the ratio of working capital minus cash and marketable securities to non-cash assets. Net Working Capital is included to control company's ability to pay current liabilities with current assets associated with bankruptcy probability. We calculate the Industry Cash Flow Volatility as the standard deviation of the

[15] Since the replacement value of assets is difficult to estimate, we often use book value of assets as a proxy of the replacement value. It is also used in many published papers.

median of Cash Flow in an industry classified by two-digit SIC codes in the prior five years. Industry cash-flow volatility is included to control the cash flow uncertainty.

We also include year dummy variables, industry dummy variables and country dummy variables in our regressions. Among these dummy variables, we use country dummy variables to control the time-invariant characteristics in different countries. For example, Dittmar et al. (2003) include the variables such as shareholder rights as developed by La Porta et al. (1997), a dummy variable indicating whether the country has the tradition of common law or civil law, the level of external capital as documented in La Porta et al. (1997), and the level of private credit as documented in Levine, Loayza, and Beck (2000). However, these variables are all time-invariant in different countries.[16] It means that we do not need to include these four variables as additional control variables in the regression because they have already been controlled by the country dummy variables.

2.5 Methodology

In this section, we discuss the methodologies to handle the potential endogeneity problem.

2.5.1 The potential endogeneity problem

One may propose an argument that the potential endogeneity problem exists due to the reverse causality exists. For example, suppose firms in a country generally hold a lower level of cash. The workers in the country may be concerned that generally the firms in the country are not in a financially stable situation, and that these firms may have a shortage of corporate liquidity in the future and will fire workers to reduce expenditures. Consequently, more workers will join the labor unions to protect themselves, resulting in a higher country-level union membership. In this argument, the causality is the other way around.

[16] For example, the data of shareholder rights in La Porta et al. (1997) for each country in his sample period has unique value. It means that this variable will be the same for each year in our sample period for a country. Since this is a time-invariant variable, our country dummy variables can control for the impact related with shareholder rights. This is the similar situation with other three variables.

2.5.2 Instrumental variables

We use the instrumental variables approach (e.g., Greene, 1997) with two-stage least squares estimation (2SLS) to address the potential endogeneity problem.[17] In our research setting, instrumental variables are those variables that directly affect the country-level union membership but do not directly affect a firm's choice of corporate cash holdings.

The labor economics literature has shown that both the gender (e.g., Hirsch, 1980; Hirsch, 1982) and age (e.g., Hirsch 1980; Scoville, 1971) of workers affect the demand for union services. Both gender and age are related to workers' benefits that can be obtained from labor unions, so the propensity of joining labor unions is different among workers according to their gender and age. Female workers are more likely to join labor unions because they benefit more from the collective bargaining organized by labor unions and the protection of job conditions supported by labor unions. Thus, we expect proportion of female workers are positively related to union membership. Similarly, older workers are less likely to join labor unions because they will receive a shorter time period of non-pension benefits than younger workers. Thus, we expect a negative relation between the average age of workers and union membership. Therefore, we follow the literature (e.g., Chen, Kacperczyk and Ortiz-Molina, 2011) and use the country-level data of these two variables as instrumental variables.

2.5.2.1 The gender of the workers

It is a country-level variable. The workers' gender variable is called Fraction of Female Workers and is defined as the fraction of female workers in the country a firm belongs to.

2.5.2.2 The age of the workers

It is also a country-level variable. The workers' age variable is called Average Age of the Workers and is defined as the average age of the workers in the country a firm belongs to.

[17] The instrumental variables approach can also address the potential endogeneity problem stemming from the omitted variables when one cannot exhaust all the control variables in a regression.

We collect the data on gender and age from the ILOStat database maintained by International Labor Organization. To our knowledge, no theory has been proposed in the literature to directly link the gender or age of workers to a firm's choice of corporate cash holdings.

2.5.3 The validity of the instruments and the specification

We use a series of tests to examine the validity of our instrumental variables and the specification. First, we conduct a first-stage F-test to examine the relevance of the instruments to determine whether they are weak (Stock, Wright and Yogo 2002). Then, we examine the first-stage partial R^2, which measures the strength of the instrumental variables (e.g., Shea, 1997). Moreover, we conduct the over-identifying restrictions test to examine the exogeneity of the instruments. Finally, we conduct the Hausman (1978) test to examine the difference in the estimates between the OLS estimation and the 2SLS estimation.

2.6 Results

In this section, we describe our empirical results. We start with univariate statistics, and then we report OLS regressions on the determinants of corporate cash holdings. Next, we report the results by using two-stage least squares (2SLS) estimation. Furthermore, we report the results of sub-samples separated by Employment Protection Legislation, labor bargaining centralization, and financial constraints. Finally, we report the results on how the union membership affects the market value of corporate cash holdings, and the relation between corporate cash holdings and operating profitability as well as labor costs.

2.6.1 Univariate statistics

Table 2-1 shows the univariate statistics. Panel A reports the univariate statistics of the variables. The mean of the variable Corporate Cash Holdings is 0.3418, and the median is 0.1232. The mean of the variable Union Membership is 0.2548, and the median is 0.1860. Panel B describes corporate cash holdings and union membership by countries. The mean of

corporate cash holdings, the mean of union membership, number of firm-year observations, number of firms in a country are reported in the panel. The mean of the variable Union Membership for the U.S. is 0.1289, which is significantly lower than the mean of the variable Union Membership in the whole sample as reported in the Panel A.

Figure 2-1 illustrates the mean of Union Membership from 1992 to 2013 across 66 countries. The deeper the colour in a country in the world map indicates that the mean of Union Membership is higher in that country. Figure 2-2 illustrates the mean of Corporate Cash Holdings in our sample period across 66 countries. The deeper the colour in a country in the world map indicates that the mean of Corporate Cash Holdings is higher in that country. In United States, the color in Figure 2-1 is deep while the color in Figure 2-2 is light, implying that the low Union Membership in United States is associated with high Corporate Cash Holdings.

Given such large difference in the magnitude of Union Membership between the U.S. data and international data, United States is at the lower end of the spectrum of labor unions around the world. It is meaningful to examine the impact of union membership on corporate cash holdings in the international setting.

2.6.2 OLS regression

We first use an OLS regression to examine the relation between country-level union membership and corporate cash holdings. We follow the literature (Opler, Pinkowitz, Stulz, and Williamson, 1999) and include various control variables. We also add year dummy variables, industry dummy variables and country dummy variables in the regression. We follow the literature (e.g., Fernandes and Gonenc, 2016) and cluster the standard errors at the firm level. We report the p–value in the parentheses in the tables.

Table 2-2 reports the results. We find that the coefficient of Union Membership is -0.187 (p-value = 0.01) across 66 countries in Column 1, while the coefficient of Union Membership

is -0.185 (p-value = 0.01) in Non-US firms in Column 2. Our results are consistent with Hypothesis 1 that there is a negative relation between the strength of labor unions and the level of corporate cash holdings because a firm strategically choose corporate cash holdings to gain bargaining position with the labor.

In terms of the economic magnitude, Table 2-1 reports that the standard deviation of Union Membership is 0.2503. It implies that a one standard deviation increase in Union Membership leads to a 0.047 (= (–0.187) * 0.2503) decrease in the level of Corporate Cash Holdings. Since the median of non-cash assets is 159.65 million dollars in our sample, this corresponds to a decrease in corporate cash holdings with a dollar value of 7.50 million dollars (= 0.047 * 159.65). The economic magnitude based on the OLS regression is relatively modest.

2.6.3 Country-level regression

Since we use country-level data of Union Membership, a country that has more firms takes more weight in the firm-level regression in Table 2-2. We therefore conduct a country-level analysis by giving each country an equal weight. We convert all firm-level variables into country-level variables each year by taking the average of the variables across the countries. This sample includes 974 country-year observations.

Table 2-3 reports the results. The coefficient of Union Membership is -0.125 (p-value = 0.01) across 66 countries in Column 1, while the coefficient of Union Membership for Non-US firms is -0.128 (p-value = 0.01). It implies that the country-level corporate cash holdings are lower with the presence of a higher country-level Union Membership. The results are consistent with the firm-level results in Table 2-2, and support the Hypothesis 1.

2.6.4 First-stage regression

Table 2-4 shows the first-stage regression of the 2SLS estimation. The dependent variable is Union Membership. The independent variables are two instrumental variables and other control variables. We also include year dummy variables, industry dummy variables and

country dummy variables in the regression. We find that the coefficient of the instrumental variable Fraction of Female Workers is 2.151 (p-value = 0.01) and the coefficient of Average Age of the Workers is -0.017 (p-value = 0.01).[18] The partial F-statistic is 3795.91 (p-value = 0.01), indicating that the instruments are not weak. The partial R-square is 0.32, indicating that the instruments have a reasonable strength.

2.6.5 Union membership and the corporate cash holdings

Table 2-5 shows the second stage of 2SLS estimation.[19] The dependent variable is Corporate Cash Holdings, while the independent variable is the predicted union membership and the same control variables in the first stage of 2SLS. In Column 1, the coefficient of Union Membership is –1.265 (p-value = 0.01) with the data of full sample. In Column 2, the coefficient of Union Membership is -1.744 (p-value = 0.01) with the data of non-US firms. We conduct the over-identifying restrictions test and find that the F-statistic is 1.55 (p-value = 0.21). This insignificant F-statistic indicates that these instrumental variables are exogenous and valid. We also conduct the Hausman test and find that the F-statistic is 114.47 (p-value = 0.01). This significant F-statistic implies that the 2SLS estimate reported in this table and the OLS estimate reported in Table 2-2 are significantly different. Therefore, it is more proper to draw implications based on the 2SLS estimates due to the existence of the endogeneity problem.

In terms of the economic magnitude, the 2SLS estimate is more economically significant than the OLS estimate. Using the 2SLS estimate reported in Table 2-5 and the standard deviation of Union Membership reported in Table 2-1, we find that the a one standard deviation increase in Union Membership leads to a 0.317 decrease (= (–1.265) * 0.2503) in the level of

[18] The positive coefficient of Fraction of Female Workers is consistent with the findings in Blanchflower (2006), who finds that male workers are less likely to join labor unions in public firms in a sample from 34 countries. The negative coefficient of Average Age of the Workers is consistent with the argument in Hirsch (1980) that older workers are less likely to join labor unions because they will receive a shorter time period of non-pension benefits than younger workers.

[19] We obtain the predicted union membership from the first stage regression of 2SLS estimations with two instruments and run the second stage regression.

corporate cash holding. Since the median of non-cash assets is 159.65 million dollars in our sample, this corresponds to a decrease in corporate cash holdings with a dollar value of 55.40 million dollars (= 0.317 * 159.65)

Therefore, the results in Table 2-5 are consistent with the interpretation that firms hold less cash to gain bargaining position to the labor, and support the Hypothesis 1.

2.6.6 Employment protection legislation

Several recent papers on labor and finance have developed their research setting based on Employment Protection Legislation. For example, Simintzi, Vig and Volpin (2015) examine inter-temporal variation in employment protection legislation across 21 countries. They find that labor-friendly reforms are associated with a reduction in firm leverage. Bornhall, Daunfeldt and Rudholm (2015) examine the employment protection legislation in Sweden and find that employment protection legislation seems to act as a growth barrier for small firms. Borisov, Gupta and Subramanian (2013) exploit within-country variation provided by changes in employment protection laws in OECD countries to examine the effect of stronger dismissal laws on M&A activity by U.S. firms in these countries.

We get the data of Employment Protection Legislation (EPL) indicator from OECD. It measures the procedures and relevant costs of hiring and dismissing employees, as well as working contracts. The indicators have been constructed by OECD based on statutory laws, collective bargaining agreements and case law as well as contributions from officials from OECD member countries and advice from country experts.[20] A higher level of EPL indicates better employment protection.

A higher level of employment protection implies that it is more difficult to fire workers. Consequently, it increases the operating leverage. Therefore, we expect that the impact from

[20] See the OECD website for more details about the Employment Protection Legislation indicator. http://www.oecd.org/els/emp/oecdindicatorsofemploymentprotection.htm

the perspective of operating leverage as discussed in Hypothesis 2 will be stronger for firms in countries with a higher level of employment protection. This can, at least, offset a certain degree of the impact from the bargaining perspective. Serfling (2016) find that higher firing costs lead to higher financing distress costs, which crowding out financial leverage. Therefore, we expect that the negative relation between corporate cash holding and union membership is stronger (weaker) when a firm is in a country with a lower (higher) level of employment protection.

We divide the sample into two sub-groups. A firm is in a country with higher (lower) level of employment protection if the EPL indicator of that country is above (below) the median. Table 2-6 reports the OLS regressions and the second stage of 2SLS estimations for these two sub-groups.

Table 2-6 shows the results. In Panel A, we report the OLS regressions in Column 1 and 2. The coefficient of Union Membership in Column 1 is –0.312 (p-value = 0.01) for the sub-group of firms in a country with lower level of employment protection. The coefficient of Union Membership in Column 2 is –0.083 (p-value = 0.01) for the sub-group of firms in a country with higher employment protection. We conduct a t-test of the difference in the coefficients of Union Membership between the two sub-groups separated by the EPL indicator, and report the results in Panel B. We find that the difference is –0.229 (p-value = 0.01).

Panel A also shows the second stage of 2SLS estimations in Column 3 and 4. The coefficient of Union Membership in Column 3 is –1.001 (p-value = 0.01) for the sub-group of firms in a country with lower level of employment protection. The coefficient of Union Membership in Column 4 is –0.082 (p-value = 0.16) for the sub-group of firms in a country with higher employment protection. The over-identifying restrictions test and the Hausman test show that it is more proper to draw implications based on the 2SLS estimates. The results in Column 4 support the interpretation that the operating leverage effect is stronger in the sub-group with higher EPL, which offsets the bargaining effect. Consequently, this results in the

insignificant coefficient of Union Membership in this column. We also conduct a t-test of the difference in the coefficients of Union Membership between the two sub-groups separated by the EPL indicator, and report the results in Panel B. We find that the difference is –0.920 (p-value = 0.01).

Therefore, the results in Table 2-6 imply that the negative relation between corporate cash holding and union membership is stronger (weaker) when a firm is in a country with a lower (higher) level of employment protection. This is consistent with both Hypothesis 1 and Hypothesis 2.

2.6.7 Labor bargaining centralization

The degree of labor bargaining centralization has also been used as a measure of the power of collective bargaining in the literature (Simintzi, Vig and Volpin, 2015). We get the data of labor bargaining centralization from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database.[21] In that database, the variable Centralization is an indicator of the degree of labor bargaining centralization in a country, which is a continuous variable ranging from 0 to 1.

A higher level of Centralization indicates higher power of collective bargaining in a country, because a collective bargaining will have a broader impact and will be more centrally coordinated in a country. Therefore, we expect that the negative relation between corporate cash holding and union membership is stronger (weaker) when a firm is in a country with a higher (lower) level of Centralization.

We divide the sample into two sub-groups. A firm is in a country with higher (lower) level of Centralization if the Centralization indicator of that country is above (below) the

[21] The ICTWSS database is maintained by Professor Jelle Visser, and it is publicly available at the following website when we wrote the first draft of the paper. The database covers 51 countries with nearly 200 variables and 55 years (1960-2014). http://www.uva-aias.net/208

median. Table 2-7 reports the OLS regressions and the second stage of 2SLS estimations for these two sub-groups.

Table 2-7 shows the results. In Panel A, we report the OLS regressions in Column 1 and 2. The coefficient of Union Membership in Column 1 is significantly more negative for the sub-group of firms in a country with lower level of Centralization than the coefficient for the sub-group of firms in a country with higher centralization.

Panel A also shows the second stage of 2SLS estimations in Column 3 and 4. The coefficient of Union Membership in Column 3 is –0.741 (p-value = 0.01) for the sub-group of firms in a country with lower level of Centralization. The coefficient of Union Membership in Column 4 is –9.934 (p-value = 0.01) for the sub-group of firms in a country with higher Centralization. The over-identifying restrictions test and the Hausman test show that it is more proper to draw implications based on the 2SLS estimates. We also conduct a t-test of the difference in the coefficients of Union Membership between the two sub-groups separated by the Centralization indicator, and report the results in Panel B. We find that the difference is 9.193 (p-value = 0.01).

Therefore, the results in Table 2-7 imply that the negative relation between corporate cash holding and union membership is stronger (weaker) when a firm is in a country with a higher (lower) level of Centralization. This is consistent with Hypothesis 1.

2.6.8 Financial constraints

If a firm is financially constrained, the risk of liquidity shortage stemming from a lower cash balance is more credible (Klasa, Maxwell and Ortiz-Molina, 2009). We expect that the negative relation between corporate cash holding and union membership is stronger (weaker) when a firm is financially constrained (unconstrained). We follow the literature and use two measurements of financial constraints including total payout and KZ index.

The variable Payout is defined as the ratio of dividends plus shares repurchases to assets. We divide the sample into two sub-groups separated by payout. A firm is financially constrained (unconstrained) if it does not have any payout (if it has payout).

The variable KZ index is calculated with the formula proposed by the Kaplan and Zingales (1997). A firm is financially constrained if its KZ index if above the 70th percentiles while a firm is financially unconstrained if its KZ index is below the 30th percentile. This formula is widely used to measure the financial constraints in previous literature (e.g., Baker, Stein, and Wurgler, 2003; Almeida, Campello, and Weisbach, 2004)

$$KZ\ index = -1.002 \times Cash\ Flow + 0.283 \times Q + 3.139 \times Leverage - 39.368 \times Dividends - 1.315 \times Cash\ Holdings \quad (1)$$

In Equation (1), Cash Flow is calculated as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends in year t minus depreciation in year t, divided by plant, property and equipment in year t−1. Q is defined as market capitalization in year t plus total shareholder's equity in year t minus book value of common equity in year t minus deferred tax assets in year t, divided by total shareholder's equity in year t. Leverage is defined as the ratio of total long-term debts to assets in year t. Dividends is defined as dividends in year t to long plant, property and equipment in year t−1. Cash Holdings is defined as cash and marketable securities in year t to long plant, property and equipment in year t−1

Table 2-8 shows the results. In Panel A, financial constrains are measured as total payout. We report the OLS regressions in Column 1 and 2. The coefficient of Union Membership in Column 1 is significantly more negative for the sub-group of financially unconstrained firms than the coefficient for the sub-group of financially constrained firms. Panel A also shows the second stage of 2SLS estimations in Column 3 and 4. The coefficient of Union Membership in Column 3 is –1.474 (p-value = 0.01) for the sub-group of financially constrained firms. The coefficient of Union Membership in Column 4 is –0.600 (p-value = 0.01) for the sub-group of

financially unconstrained firms. The over-identifying restrictions test and the Hausman test show that it is more proper to draw implications based on the 2SLS estimates. We also conduct a t-test of the difference in the coefficients of Union Membership between the two sub-groups separated by payout, and report the results in Panel C. We find that the difference is –0.874 (p-value = 0.01).

In Panel B, financial constrains are measured as KZ index. In OLS regressions, the coefficient of Union Membership in Column 1 is –0.140 (p-value = 0.01) for the sub-group of financially unconstrained firms, while the coefficient is -0.215 (p-value = 0.01) in Column 2 for the sub-group of financially constrained firms. The coefficient of Union Membership in Column 3 is –1.070 (p-value = 0.01) for the sub-group of financially unconstrained firms. The coefficient of Union Membership in Column 4 is –1.880 (p-value = 0.01) for the sub-group of financially constrained firms. We report the difference is 0.810 (p-value = 0.01) in the coefficients of Union Membership between two sub-groups separated by KZ index in Panel C.

Therefore, the results in Table 2-8 imply that the negative relation between corporate cash holding and union membership is stronger (weaker) when a firm is financially constrained (unconstrained). This is consistent with Hypothesis 1.

2.6.9 The market value of corporate cash holdings

To better understand the negative relation between country-level union membership and corporate cash holdings, we examine how labor unions affect the market value of cash. We use the model of Fama and French (1998) to examine the market value of cash. This model has been widely used in the literature about corporate cash holdings (e.g. Dittmar and Mahrt-Smith, 2007; Bates, Kahle, and Stulz, 2009; Pinkowitz and Williamson, 2007).

We divide the sample into two sub-groups separated by union membership. A firm in a country with higher (lower) union membership if its country-level union membership is above (below) the median. Corporate cash holdings increase the market value of firms (e.g. Dittmar

and Mahrt-Smith, 2007). When firms hold more cash, there are more internal resources available for collective bargaining and firms lose bargaining positions with labor unions. It decreases the market value of cash to shareholders. If a firm in a country with higher union membership, they lose more bargaining power in that there are stronger labor unions. This situation further lowers the market value of cash. Therefore, we expect the market value of corporate cash holdings is lower (higher) for firms in countries with higher (lower) union membership. We examine the difference in the market value of cash between the two sub-groups.

We use the following equation based on Fama and French (1998).

$$V_{i,t} = \beta_0 + \beta_1 C_{i,t} + \beta_2 E_{i,t} + \beta_3 dE_{i,t} + \beta_4 dE_{i,t+2} + \beta_5 R\&D_{i,t} + \beta_6 dR\&D_{i,t} + \beta_7 dR\&D_{i,t+2}$$
$$+\beta_8 D_{i,t} + \beta_9 dD_{i,t} + \beta_{10} dD_{i,t+2} + \beta_{11} I_{i,t} + \beta_{12} dI_{i,t} + \beta_{13} dI_{i,t+2} + \beta_{14} dNA_{i,t}$$
$$+\beta_{15} dNA_{i,t+2} + \beta_{16} dV_{i,t+2} + Year\ Dummy\ Variables$$
$$+Industry\ Dummy\ Variables + Country\ Dummy\ Variable + \varepsilon_{i,t} \quad (2)$$

The coefficient β_1 in the Equation (2) is the measure of the market value of an additional dollar. For each independent variable Xt is the level of the variable X in year t, divided by total assets in year t. dXt is the change in the level of the variable X from year t-2 to year t, divided by total assets in year t (dXt = (Xt − Xt−2)/At). dXt+2 is the change in the level of the variable X from year t + 2 to year t, divided by total assets in year t (dXt+2 = (Xt+2 − Xt)/At). Market Value of Firm is the market value of firm, which is defined as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt.

Table 2-9 shows the results. In Panel A, we report the OLS regressions in Column 1 and 2. The coefficient of Cash in Column 1 is 1.454 (p-value = 0.01) for the sub-group of firms with lower country-level union membership. The coefficient of Cash in Column 2 is 1.006 (p-value = 0.01) for the sub-group of firms with higher country-level union membership. We conduct a t-test of the difference in the coefficients of Cash between the two sub-groups

separated by union membership, and report the results in Panel B. We find that the difference is 0.445 (p-value = 0.01).

When firms hold more cash, there are more internal resources available for collective bargaining. Workers in a country with higher union membership may be able to get a larger part out of these cash holdings through collective bargaining because of higher bargaining power. This higher labor costs increase the operating costs that have negative effects on the market value of cash for shareholders. Therefore, the results in Panel A of Table 2-9 imply that the market value of corporate cash holdings is lower (higher) for firms in countries with higher (lower) union membership. It is consistent with the bargaining hypothesis.

2.6.10 Corporate cash holdings and profitability

In this section, we investigate how labor unions affect the relation between corporate cash holdings and operating profitability. If firms hold a certain amount of cash holdings, workers in a country with stronger labor unions may be able to get a larger part out of these cash holdings through collective bargaining because of higher bargaining power. Consequently, firms' operating profitability will be lower. Conversely, firms may retain these cash holdings if workers are in countries with weaker labor unions because of lower bargaining power. Consequently, firms' operating profitability will be higher. Therefore, we expect that the contribution of corporate cash holdings to operating profitability is higher (lower) when the country-level union membership is lower (higher).[22]

We use ROA as the measure of a firm's operating profitability. ROA is defined as the ratio of earnings before interests and taxes (EBIT) to total assets. We divide the sample into

[22] There is still a debate in the literature regarding the relation between corporate cash holdings and operating profitability. Although some papers find a positive relation between cash and operating profitability (e.g., Mikkelson and Partch 2003; Fresard 2010), other papers find a negative relation between them (e.g., Harford 1999; Dittmar and Mahrt-Smith 2007). However, our results do not depend on a generally positive or negative relation between cash and operating profitability. Instead, our results depend on the difference in the coefficients of Corporate cash holdings among the four quartiles divided by country-level union membership.

two sub-groups separated by country-level union membership. A firm is in a country with higher (lower) union membership if its country-level union membership is above (below) the median.

Table 2-10 shows the results. In Panel A, we report the OLS regressions in Column 1 and 2. The coefficient of Corporate Cash Holdings in Column 1 is 0.031 (p-value = 0.01) for the sub-group of firms with lower country-level union membership. The coefficient of Union Membership in Column 2 is 0.003 (p-value = 0.01) for the sub-group of firms with higher country-level union membership. The positive coefficients of corporate cash holdings imply that more corporate cash holdings is associated higher operating profitability. We conduct a t-test of the difference in the coefficients of Corporate Cash Holdings between the two sub-groups separated by union membership, and report the results in Panel B. We find that the difference is 0.028 (p-value = 0.01). The significant difference implies that the positive relation between corporate cash holdings and operating profitability is stronger for firms in countries with lower union membership.

Suppose firms have more cash holdings and have more operating profitability in a country with labor unions. Labor unions observe the situation that firms have a large amount of cash holdings. They tend to organize collective bargaining to increase their wages and other benefits, this increasing operating costs from labor costs lower firms' operating profitability. The higher country-level corporate cash holdings, the stronger negative effects on firms' operating profitability. Therefore, the results in Table 2-10 imply that the positive relation between corporate cash holdings and operating profitability is stronger for firms in countries with lower union membership. This is consistent with the interpretation that the contribution of corporate cash holdings to operating profitability is higher (lower) when the country-level union membership is lower (higher). The results are consistent with the Hypothesis 1.

2.6.11 Corporate cash holdings and labor costs

In this section, we investigate how labor unions affect the relation between corporate cash holdings and labor costs. Given a certain amount of corporate cash holdings, workers in countries with stronger labor unions may be able to get a larger part out of these cash holdings through collective bargaining to increase their wages and gain more benefits because of higher bargaining power. Consequently, firms' labor costs will be higher. Therefore, we expect that the contribution of corporate cash holdings to labor costs is higher (lower) when the country-level union membership is higher (lower).

We obtain a sub-sample of the firms whose data of labor costs are available in Compustat. This sub-sample includes 77380 firm-year observations. We follow Chemmanur, Cheng and Zhang (2013) and define the labor costs as the average employee pay. In the regressions, the dependent variable is the logarithm of Average Labor Costs. We follow Chemmanur, Cheng and Zhang (2013) and include size, leverage, average sales per employee, market to book ratio and tangibility as control variables. We divide the sample into two sub-groups separated by country-level union membership. A firm is in a country with higher (lower) union membership if its country-level union membership is above (below) the median.

Table 2-11 shows the results. In Panel A, we report the OLS regressions in Column 1 and 2. The coefficient of Corporate Cash Holdings in Column 1 is 0.334 (p-value = 0.01) for the sub-group of firms with lower country-level union membership. The coefficient of Corporate Cash Holdings in Column 2 is 0.504 (p-value = 0.01) for the sub-group of firms with higher country-level union membership. The positive coefficients imply that there is a positive relation between corporate cash holdings and labor costs. We conduct a t-test of the difference in the coefficients of Corporate Cash Holdings between the two sub-groups separated by union membership, and report the results in Panel B. We find that the difference is –0.170 (p-value = 0.01). The significant difference implies that the coefficient of Corporate cash holdings for the

sub-group of firms with lower country-level union membership is significantly lower than the coefficient of Corporate cash holdings for the sub-group of firms with higher country-level union membership.

Therefore, the results in Table 2-11 imply that the positive relation between corporate cash holdings and labor costs is weaker for firms in countries with lower union membership. When firms hold more cash, they lose bargaining positions to labor unions because labor unions tend to claim more wages and other benefits in that firms have sufficient cash reserves. When there is higher country-level union membership, labor unions have more bargaining power in this country. It strengthens labor unions' bargaining positions and further raise the wage demands in collective bargaining when workers find firms have more cash holdings. As a result, a firm in this country have to pay more labor costs compared with a firm in a country with lower union membership. The higher the union membership in a country, the stronger positive effects of corporate cash holdings on a firm's labor costs. This is consistent with the interpretation that there will be more (fewer) positive effects of corporate cash holdings on labor costs when the country-level union membership is higher (lower). The results are consistent with the Hypothesis 1.

2.6.12 Corporate cash holdings and strikes & lockouts

To further investigate how corporate cash holdings affect firms' bargaining power in a country, we examine the relation between corporate cash holdings and the country-level strikes & lockouts. Myers and Saretto (2015) show a negative relation between the level of corporate leverage and the likelihood of strikes organized by labor unions before contract negotiations. They argue that the higher level of corporate leverage strengthens firms' bargaining power in wage negotiations with labor unions. In this thesis, previous results support the bargaining hypothesis that firms lower their corporate cash holdings to gain bargaining position with labor unions. If firms hold less cash, strikes and lockouts are less likely to occur because employees

get less benefits through these activities. If firms hold more cash, workers tend to increase their wage demands and organize strikes to threat firms satisfy their demands. Then, we expect that there should be a positive relation between corporate cash holdings and the intensity of strikes & lockouts.

We collect the data of strikes & lockouts from the International Labor Organization. The data of strikes & lockouts start from 2000 and are available for 52 countries in our sample. We construct a variable called Log (Country-level Strikes & Lockouts + 1), where the Country-level Strikes & Lockouts are defined as the total number of strikes and lockouts in a country. We also collect the data of labor force from International Labor Organization as an additional control variable. Labor Force is defined as the sum of all persons of working age who are employed and those who are unemployed. Since the data of strikes & lockouts are at the country level, we conduct the country-level analysis in a similar way as Table 2-3. We convert all firm-level variables into country-level variables by taking the average of the variables across the countries.

We report the results in Table 2-12. The coefficient of the Country-level Corporate Cash Holdings is 0.616 (p-value = 0.08). The positive coefficient indicates that there is a positive relation between strikes & lockouts and corporate cash holdings in a country. When firms hold more cash, labor unions have more incentive to increase their wage demands They tend to organize a strike to strengthen their bargaining power in negotiations with firms. As a result, there will be more strikes & lockouts in a country when corporate cash holdings are higher in that country. Therefore, the results in Table 2-12 support the bargaining hypothesis in that labor unions organize more strikes to gain bargaining power when firms hold more cash.

2.7 Robustness Checks

We conduct robustness checks in this section.

2.7.1 The validity of instrumental variables

Since we use country-level instrumental variables in our paper, they may be correlated with other country-level characteristics, which can lower the validity of the instrumental variables. For example, it has found that female workers earn less compared with male workers. On one hand, if there are more female workers in a country, the average salary in that country will be lower. Consequently, firms in that country will have more cash reserves. On the other hand, the coefficient of Fraction of Female Workers in Table 2-4 is positive, which means more female workers are associated with higher union membership. This leads to a negative relationship between corporate cash holding and union membership. However, it is driven by the gender pay gap rather than the bargaining power.

Therefore, we collect the data of global gender gap from the World Economic Forum. The global gender gap index measures the gender equality in different countries. The index is constructed based on the equality between women and men across four key areas: health, education, economy and politics. The data are available from 2006. For the sample period before 2006, we use the data of 2006 as a proxy of the index for each year. We use the data of 2006 as a proxy because there is limited variation of this index over time. The index ranges from 0 to 1. The higher index means that female and male are more equal in a country. We divide our sample into two sub-groups based on the median. A firm is in a country with lower (higher) gender gap if the index is above (below) the median.

Table 2-13 shows the results. We show the second stage of two 2SLS estimation for brevity. Column 1 shows that the coefficient of Union Membership is -1.263 (p-value = 0.01), and Column 2 shows that such coefficient is -1.264 (p-value = 0.01). We conduct t-test and find that the difference is 0.001 (p-value = 0.94). The results imply that after we control for the gender gap, we still find that firms in countries with higher union membership have less corporate cash holdings in both sub-groups. Therefore, the findings support the interpretation

that the results are not entirely driven by the gender pay gap and that they are consistent with our bargaining hypothesis.

2.7.2 Alternative measurements of bargaining power

In previous analysis, we use union membership as the measurement of labor unions' bargaining power, however, there are also alternative data related to bargaining power of labor unions including union law index and collective bargaining coverage rate.

Botero et al. (2004) construct the union law index by using the data of employment laws, collective relations, social security laws and other labor protection items across 85 countries in 1997. The higher the index, the more extensive legal protection of employees. They argue that this index captures regulations of labor markets from different aspects across countries. It may be alternative measure of bargaining power because it reflects the strength of labor unions across countries. However, the main data source of the index is the sample established by Djankov et al. (2002) with data only available in 1997. We don't include this index in our empirical analysis because the index is time invariant. Besides, the index is outdated because several aspects of this index have been already covered in supplemental analyses with more recent data.

Another possible measure of labor unions' bargaining power is the collective bargaining coverage rate. The consequence of collective bargaining may apply to the workers who do not belong to labor unions. For example, the union membership in France is 7.92%, which is much lower than the average union membership in our sample. However, the collective bargaining coverage rate in France is 95.8%[23], implying that most French workers are covered by collective bargaining. In this case, there is a limitation to use union membership as the measure of bargaining power, given such a high collective bargaining coverage rate in France.

[23] This is the average country-level Collective Bargaining Coverage Rate in France from 1992 to 2013.

Therefore, we use collective bargaining coverage rate as an alternative measure of the bargaining power of labor unions. We collect the data of Collective Bargaining Coverage Rate from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database. The database reports the collective bargaining coverage rate in intervals. If the data is not available in a year, we use the data available in the most closest precedent year as a proxy for the Collective Bargaining Coverage Rate in that year.[24] The variable Collective Bargaining Coverage Rate is defined as the percentage of workers who are covered by the collective bargaining agreements, including both unionized workers and ununionized workers.

We show the results about Collective Bargaining Coverage Rate in Table 2-14. We use the similar specifications as in previous tables. Column 1 of Panel A shows the results of OLS regression. The coefficient of Collective Bargaining Coverage Rate is -0.234 (p-value = 0.01). Column 2 shows the second stage of 2SLS estimation. The coefficient of Collective Bargaining Coverage Rate is -1.063 (p-value = 0.01). The results are similar with the previous tables that there is a negative relation between Collective Bargaining Coverage Rate and corporate cash holdings. We conduct the test on the market value of cash in countries whose Collective Bargaining Coverage Rate are above or below the median. Column 1 of Panel B shows that the coefficient of Cash is 1.485 (p-value = 0.01) in countries with lower collective bargaining coverage rate. Column 2 of Panel B shows the coefficient of Cash is 1.054 (p-value = 0.01) in countries with higher collective bargaining coverage rate. We conduct a t-test of the difference in the coefficients of Cash between the two sub-groups separated by the Collective Bargaining Coverage Rate, and report the results in Panel C. We find that the difference is 0.431 (p-value = 0.01). Our results are consistent with the previous tables in that the value of cash is lower in

[24] For example, the data of Collective Bargaining Coverage Rate is available for France in 1990, 1997, 2004, 2008, 2009 and 2012. We use the data of 1990 as a proxy for the Collective Bargaining Coverage Rate in France between 1992 and 1996, use the data of 1997 as a proxy between 1998 and 2003, and so on.

countries with higher collective bargaining coverage rate. Therefore, we find similar results when we use collective bargaining coverage rate as alternative proxy for bargaining power of labor unions.

2.7.3 Fixed effects model and mixed effects model

To test the independencies of observations within an industry and within a country, we apply fixed effects approach and random effects approach to each chapter. In fixed effects model, we control the fixed effects of country and industry and class our observations by country and industry. In mixed effects model, the country effects are random. Our results of both fixed effects model and mixed effects model are consistent with our original results from OLS estimations and support the bargaining hypothesis.[25]

2.7.4 CPI deflation

We use CPI deflated data and conduct the robustness checks.[26] We get the Consumer Price Index data across countries from World Bank. The variables are deflated to their corresponding level in 2010 using the CPI. We find consistent results with the CPI deflation.

2.8 Conclusion

We examine how the presence of labor unions affects corporate cash holdings in the international setting. We use country-level union membership as the measure of the bargaining power of labor unions across countries. We use two-stage least square estimation accompanied with the econometrics tests for the validity of the instruments and the specification.

We find that firms in countries with higher union membership have less corporate cash holdings. We divide the firms into sub-groups and find that this negative relationship is stronger for firms in countries with weaker employment protection legislation, for firms in countries

[25] The independent variable are cash, dividends, repurchase, and total payout in corresponding chapters. In the mixed effects model, we test the industry fixed effects and the country random effects with above independent variables in each chapter. The coefficients of union membership are similar with the coefficients of OLS regressions in table 2 in each chapter. The results are available from the authors upon request.

[26] The results are not tabulated for brevity, and are available from the authors upon request.

with a higher degree of labor bargaining centralization, and for financially constrained firms. Moreover, we find that the market value of corporate cash holdings is lower for firms in countries with higher union membership. We also find that the positive relation between corporate cash holdings and operating profitability is stronger for firms in countries with lower union membership, and that the positive relation between corporate cash holdings and labor costs is weaker for firms in countries with lower union membership. Furthermore, we find that the number of strikes & lockouts is higher in countries with more corporate cash holdings. In addition, we conduct robustness checks by using gender gap and collective bargaining coverage rate, and find consistent results.

Our findings are consistent with the bargaining hypothesis, and we conclude that firms strategically choose corporate cash holdings to gain the bargaining position with labor in the international setting.

Table 2-1 Univariate Statistics

This table shows univariate statistics. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. Panel A reports univariate statistics. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets. *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Fraction of Female Workers* is defined as the fraction of female workers in the country a firm belongs to. *Average Age of the Workers* is the average age of the workers in the country a firm belongs to. *Employment Protection Legislation* is the OECD indicators of employment protection legislation that measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts in a country. *Centralization* is an indicator of the degree of labor bargaining centralization in a country from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database. Panel B reports the mean of corporate cash holdings, the mean of union membership, number of firm-year observations, number of firms by countries.

Panel A. Univariate Statistics

	Mean	Median	25th Percentile	75th Percentile	Standard Deviation
Corporate Cash Holdings	0.342	0.123	0.043	0.306	1.128
Union Membership	0.255	0.186	0.129	0.279	0.250
Size	18.995	18.888	17.624	20.265	2.005
Tobin's Q	1.713	1.244	0.958	1.849	1.456
Leverage	0.146	0.083	0.001	0.227	0.179
Capital Expenditures	0.073	0.046	0.022	0.086	0.090
Dividends	0.014	0.000	0.000	0.013	0.037
Cash Flow	-0.007	0.031	-0.016	0.077	0.832
R&D	0.044	0.000	0.000	0.014	0.431
Net Working Capital	0.023	0.023	-0.088	0.167	0.243
Industry Cash Flow Volatility	0.126	0.088	0.054	0.163	0.096
Fraction of Female Workers	0.439	0.454	0.419	0.464	0.038
Average Age of the Workers	39.718	39.557	38.335	40.962	2.133
Employment Protection Legislation	1.362	1.369	0.257	2.194	0.970
Centralization	0.258	0.224	0.153	0.309	0.126

Panel B. Corporate Cash Holdings and Union Membership by Countries

Country	Corporate Cash Holdings	Union Membership	Firm-year Observations	Firms	Country	Corporate Cash Holdings	Union Membership	Firm-year Observations	Firms
Argentina	0.092	0.382	171	60	Malaysia	0.199	0.103	11010	1022
Australia	0.420	0.214	13690	2000	Malta	0.100	0.546	57	7
Austria	0.204	0.341	1287	126	Mauritius	0.046	0.257	89	20
Belgium	0.233	0.543	1669	157	Mexico	0.106	0.159	1803	124
Brazil	0.187	0.253	3018	363	Namibia	0.176	0.304	1	1
Bulgaria	0.152	0.166	137	30	Netherlands	0.189	0.217	3117	263
Canada	0.357	0.288	18839	2822	New Zealand	0.146	0.217	1309	157
Chile	0.095	0.144	1962	165	Norway	0.323	0.544	2654	342
China	0.360	0.457	44077	5807	Peru	0.127	0.042	538	80
Colombia	0.083	0.165	60	36	Philippines	0.196	0.145	1674	179
Croatia	0.106	0.328	288	60	Poland	0.162	0.152	2731	422
Cyprus	0.160	0.530	390	54	Portugal	0.067	0.215	778	75
Czech	0.098	0.241	210	33	Russia	0.144	0.317	1181	238
Denmark	0.286	0.710	1968	185	Serbia	0.120	0.279	4	4
Egypt	0.203	0.275	59	59	Singapore	0.316	0.183	7009	758
Estonia	0.165	0.092	162	17	Slovakia	0.072	0.256	81	12
Finland	0.214	0.726	1987	157	Slovenia	0.089	0.319	273	28
France	0.255	0.079	10171	1017	South Africa	0.208	0.338	2648	340
Germany	0.281	0.225	10171	992	South Korea	0.212	0.104	8706	1497
Greece	0.131	0.243	2633	269	Spain	0.113	0.167	2101	183
Hungary	0.139	0.193	307	32	Sri Lanka	0.125	0.142	659	146
Iceland	0.207	0.832	94	15	Sweden	0.291	0.741	4360	516
India	0.136	0.175	4764	1693	Switzerland	0.277	0.193	3628	276
Indonesia	0.163	0.152	1009	257	Tanzania	0.097	0.202	3	3
Ireland	0.342	0.369	1450	126	Thailand	0.166	0.029	1097	406
Israel	0.614	0.373	1132	389	Trinidad and Tobago	0.211	0.210	11	11
Italy	0.166	0.350	3533	346	Turkey	0.155	0.072	2425	273
Japan	0.252	0.201	52109	3866	Ukraine	0.043	0.647	11	8
Kazakhstan	0.176	0.423	30	12	United Kingdom	0.302	0.294	23899	2783
Kuwait	0.163	0.023	10	10	United States	0.454	0.129	93389	11132
Latvia	0.092	0.164	140	17	Vietnam	0.209	0.146	189	189
Lithuania	0.059	0.108	299	37	Zambia	0.054	0.057	7	7
Luxembourg	0.257	0.385	428	47	Zimbabwe	0.076	0.075	19	19

Figure 2-1 Union Membership around the world

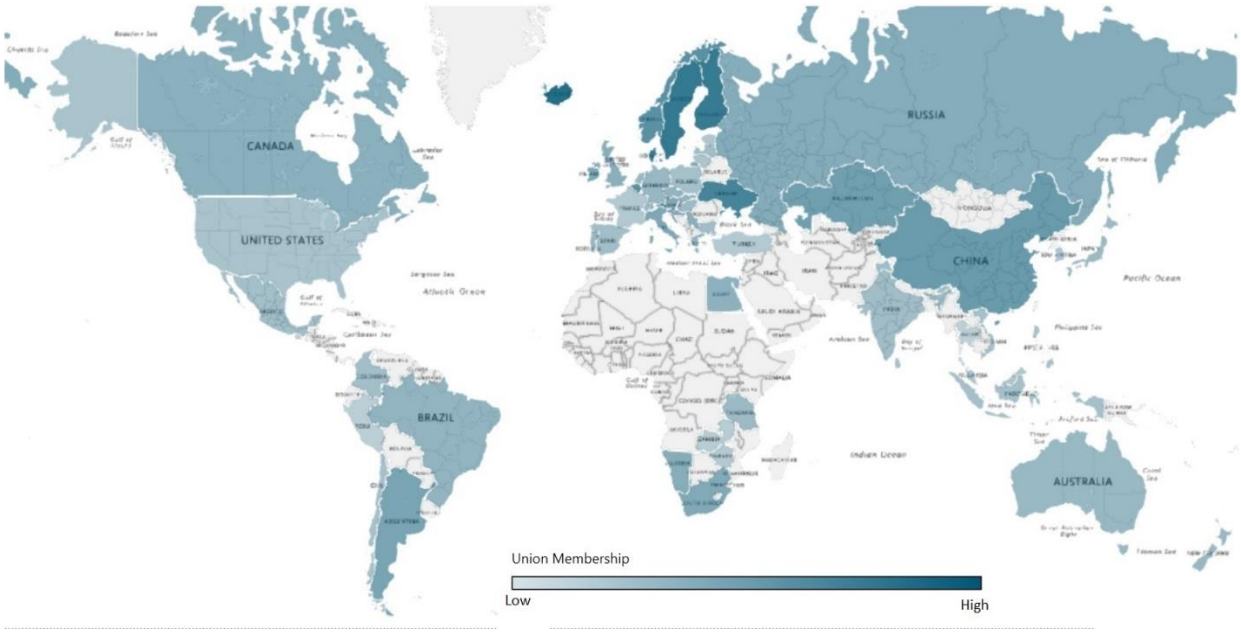

Figure 2-2 Corporate Cash Holdings around the World

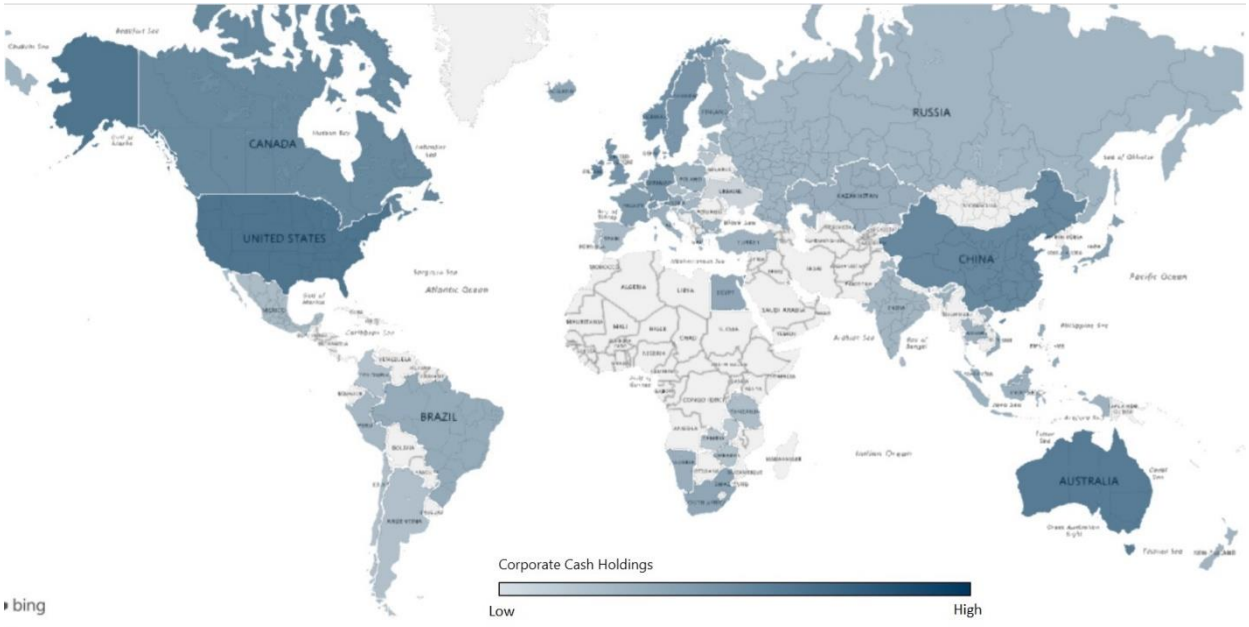

Table 2-2 Union Membership and Corporate Cash Holdings

This table shows an OLS regression about union membership and corporate cash holdings. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets. *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses.

	Corporate Cash Holdings	
	Full sample	Non-US firms
Intercept	2.545	2.158
	(0.01)	(0.01)
Union Membership	-0.187	-0.185
	(0.01)	(0.01)
Size	-0.106	-0.094
	(0.01)	(0.01)
Tobin's Q	0.021	0.029
	(0.01)	(0.01)
Leverage	-0.247	-0.187
	(0.01)	(0.01)
Capital Expenditure	0.858	0.682
	(0.01)	(0.01)
Dividends	2.266	3.230
	(0.01)	(0.01)
Cash Flow	-0.326	-0.480
	(0.01)	(0.01)
R&D	0.969	0.963
	(0.01)	(0.01)
Net Working Capital	-0.420	-0.262
	(0.01)	(0.01)
Industry Cash Flow Volatility	0.276	0.271
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	355715	262326
Adjusted R-square	0.53	0.41

Table 2-3 Union Membership and Corporate Cash Holdings: Country-level Analysis

This table shows an OLS regression on the country-level analysis about union membership and corporate cash holdings. We convert all firm-level variables into country-level variables by taking the average of the variables across the countries. The full sample includes 974 country-year observations between 1992 and 2013. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets. *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p-value is noted in the parentheses.

	Country-level Corporate Cash Holdings	
	Full sample	Non-US firms
Intercept	1.281	1.361
	(0.01)	(0.01)
Union Membership	-0.125	-0.128
	(0.01)	(0.01)
Country-level Size	-0.045	-0.051
	(0.01)	(0.01)
Country-level Tobin's Q	0.016	0.014
	(0.03)	(0.05)
Country-level Leverage	-0.314	-0.322
	(0.01)	(0.01)
Country-level Capital Expenditure	0.687	0.683
	(0.01)	(0.01)
Country-level Dividends	0.718	0.784
	(0.01)	(0.07)
Country-level Cash Flow	-0.189	-0.182
	(0.01)	(0.01)
Country-level R&D	1.824	1.778
	(0.01)	(0.01)
Country-level Net Working Capital	-0.024	0.000
	(0.76)	(1.00)
Country-level Cash Flow Volatility	0.970	1.070
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	974	952
Adjusted R-square	0.78	0.74

Table 2-4 Two-stage Least Square Estimation: First Stage

This table shows the first stage of two-stage least square estimation. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Fraction of Female Workers* is defined as the fraction of female workers in the country a firm belongs to. *Average Age of the Workers* is the average age of the workers in the country a firm belongs to. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	Union Membership
Intercept	-0.053
	(0.02)
Fraction of Female Workers	2.151
	(0.01)
Average Age of the Workers	-0.017
	(0.01)
Size	-0.001
	(0.01)
Tobin's Q	-0.002
	(0.01)
Leverage	-0.005
	(0.01)
Capital Expenditure	-0.036
	(0.01)
Dividends	0.085
	(0.01)
Cash Flow	-0.001
	(0.17)
R&D	-0.003
	(0.01)
Net Working Capital	-0.026
	(0.01)
Industry Cash Flow Volatility	-0.019
	(0.01)
Year Dummy Variables	YES
Industry Dummy Variables	YES
Country Dummy Variables	YES
Number of Observations	355715
Adjusted R-square	0.73
Partial F-statistic (p-value)	0.01
Partial R-square	0.32

Table 2-5 Two-stage Least Square Estimation: Second Stage

This table shows the second stage of two-stage least square estimation. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses.

	Corporate Cash Holdings	
	Full sample	Non-US firms
Intercept	3.436	3.802
	(0.01)	(0.01)
Union Membership	-1.265	-1.744
	(0.01)	(0.01)
Size	-0.142	-0.159
	(0.01)	(0.01)
Tobin's Q	0.019	0.035
	(0.01)	(0.01)
Leverage	-0.112	-0.076
	(0.01)	(0.01)
Capital Expenditure	1.037	1.099
	(0.01)	(0.01)
Dividends	2.631	4.149
	(0.01)	(0.01)
Cash Flow	-0.278	-0.435
	(0.01)	(0.01)
R&D	4.077	4.389
	(0.01)	(0.01)
Net Working Capital	-0.889	-0.751
	(0.01)	(0.01)
Industry Cash Flow Volatility	0.332	0.313
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	355715	262326
Adjusted R-square	0.39	0.36
Over-identifying Restrictions Test (p-value)	0.21	0.44
Hausman Test (p-value)	0.01	0.01

Table 2-6 Employment Protection Legislation

This table shows OLS regressions and the second-stage regressions of the 2SLS estimation for the sub-groups separated by the employment protection legislation. We use a sample of 289889 firm-year observations from 41 countries between 1992 and 2013. Panel A shows the regressions. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Employment Protection Legislation* is the OECD indicators of employment protection legislation that measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts in a country. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions

	Corporate Cash Holdings			
	OLS		The Second Stage of 2SLS	
	EPL < Median	EPL ≥ Median	EPL < Median	EPL ≥ Median
Intercept	3.301	1.813	4.669	1.925
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	-0.312	-0.083	-1.001	-0.082
	(0.01)	(0.01)	(0.01)	(0.16)
Size	-0.119	-0.080	-0.189	-0.080
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.011	0.035	0.016	0.036
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.321	-0.171	-0.188	-0.164
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	1.019	0.667	1.374	0.673
	(0.01)	(0.01)	(0.01)	(0.01)
Dividends	1.497	3.017	3.502	3.072
	(0.01)	(0.01)	(0.01)	(0.01)
Cash Flow	-0.309	-0.459	-0.490	-0.463
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	0.916	0.978	4.237	0.974
	(0.01)	(0.01)	(0.01)	(0.01)
Net Working Capital	-0.604	-0.239	-1.146	-0.239
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	0.039	0.234	0.032	0.071
	(0.52)	(0.03)	(0.69)	(0.46)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	160992	128897	160992	128897
Adjusted R-square	0.59	0.40	0.41	0.40
Over-identifying Restrictions Test (p-value)			0.46	0.38
Hausman Test (p-value)			0.01	0.04

Panel B. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Corporate Cash Holdings between the two sub-groups separated by EPL and reports the p-value of the t-test in the parentheses.

	Union Membership	
	OLS	Second Stage of 2SLS Estimation
Difference	-0.229	-0.920
(p-value)	(0.01)	(0.01)

Table 2-7 Labor Bargaining Centralization

This table shows OLS regressions and the second-stage regressions of the 2SLS estimation for the sub-groups separated by the labor bargaining centralization. We use a sample of 259655 firm-year observations from 32 countries between 1992 and 2013. Panel A shows the regressions. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Centralization* is an indicator of the degree of labor bargaining centralization in a country from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions

	Corporate Cash Holdings			
	OLS		The Second Stage of 2SLS	
	Centralization < Median	Centralization ≥ Median	Centralization < Median	Centralization ≥ Median
Intercept	1.150	2.237	3.044	2.952
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	-0.240	-0.319	-0.741	-9.934
	(0.01)	(0.01)	(0.01)	(0.01)
Size	-0.044	-0.088	-0.118	-0.050
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.022	0.036	0.003	0.035
	(0.01)	(0.01)	(0.10)	(0.01)
Leverage	-0.139	-0.294	-0.394	-0.134
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	0.502	0.485	1.576	0.307
	(0.01)	(0.01)	(0.01)	(0.01)
Dividends	0.715	2.881	1.790	1.590
	(0.01)	(0.01)	(0.01)	(0.01)
Cash Flow	-0.027	-0.553	-0.245	-0.084
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	1.903	0.787	0.995	1.487
	(0.01)	(0.01)	(0.01)	(0.01)
Net Working Capital	-0.174	-0.318	-0.669	-0.087
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	0.144	0.299	-0.197	0.087
	(0.01)	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	129913	129742	129913	129742
Adjusted R-square	0.56	0.48	0.60	0.33
Over-identifying Restrictions Test (p-value)			0.22	0.82
Hausman Test (p-value)			0.01	0.01

Panel B. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by Centralization and reports the p-value of the t-test in the parentheses.

	Union Membership	
	OLS	Second Stage of 2SLS Estimation
Difference	0.078	9.193
(p-value)	(0.01)	(0.01)

Table 2-8 Financial Constraints

This table shows OLS regressions and the second-stage regressions of the 2SLS estimation for the sub-groups separated by the financial constraints. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. Panel A shows the regressions with the measure of financial constraints is *Total Payout*. Panel B shows the regressions with the measure of financial constraints is *KZ index*. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Payout* is defined as the ratio of dividends plus shares repurchases to assets. *KZ index* is calculated with the formula discussed in 2.6.8. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel C shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions with the measure of financial constraints is Total Payout.

	Corporate Cash Holdings			
	OLS		The Second Stage of 2SLS	
	Payout = 0	Payout > 0	Payout = 0	Payout > 0
Intercept	2.912	2.340	4.563	3.207
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	-0.219	-0.072	-1.474	-0.600
	(0.01)	(0.01)	(0.01)	(0.01)
Size	-0.120	-0.089	-0.200	-0.133
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.028	0.026	0.037	0.028
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.260	-0.246	-0.033	-0.046
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	0.951	0.432	1.559	0.574
	(0.01)	(0.01)	(0.01)	(0.01)
Cash Flow	-0.341	-0.179	-0.038	-0.047
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	0.946	1.224	4.924	4.159
	(0.01)	(0.01)	(0.01)	(0.01)
Net Working Capital	-0.360	-0.680	-0.798	-0.857
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	0.246	0.286	0.376	0.521
	(0.01)	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	262237	93478	262237	93478
Adjusted R-square	0.54	0.48	0.35	0.33
Over-identifying Restrictions Test (p-value)			0.36	0.31
Hausman Test (p-value)			0.01	0.01

Panel B. Regressions with the measure of financial constraints is KZ index.

	Corporate Cash Holdings			
	OLS		The Second Stage of 2SLS	
	KZ index < 30th Percentile	KZ index ≥ 70th Percentile	KZ index < 30th Percentile	KZ index ≥ 70th Percentile
Intercept	2.419	3.500	5.002	4.116
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	-0.140	-0.215	-1.070	-1.880
	(0.01)	(0.01)	(0.01)	(0.01)
Size	-0.111	-0.159	-0.207	-0.166
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.050	-0.001	0.032	0.004
	(0.01)	（0.65）	(0.01)	（0.01）
Leverage	-0.335	-0.383	-0.588	-0.340
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	0.786	0.846	2.213	0.862
	(0.01)	(0.01)	(0.01)	(0.01)
Cash Flow	-0.009	-0.570	-0.395	-0.370
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	0.362	1.582	1.019	0.769
	(0.01)	(0.01)	(0.01)	(0.01)
Net Working Capital	-0.340	-0.183	-0.843	-0.170
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	0.721	-0.244	0.931	-0.110
	(0.01)	(0.01)	(0.01)	（0.11）
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	262237	93478	262237	93478
Adjusted R-square	0.54	0.48	0.35	0.33
Over-identifying Restrictions Test (p-value)			0.36	0.31
Hausman Test (p-value)			0.01	0.01

Panel C. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by payout and reports the p-value of the t-test in the parentheses.

	Union Membership			
	Financial constraints is measured by Total Payout		Financial constraints is measured by KZ index	
	OLS	Second Stage of 2SLS Estimation	OLS	Second Stage of 2SLS Estimation
Difference	-0.147	-0.874	0.075	0.810
(p-value)	(0.01)	(0.01)	(0.01)	(0.01)

Table 2-9 The Market Value of Corporate Cash Holdings

This table shows the regressions of the market value of corporate cash holdings for the sub-groups separated by union membership. We use a sample of 251947 firm-year observations from 66 countries between 1992 and 2013. Panel A shows the regressions. For each independent variable X_t is the level of the variable X in year t, divided by total assets in year t. dX_t is the change in the level of the variable X from year t - 2 to year t, divided by total assets in year t ($dX_t = (X_t - X_{t-2})/A_t$). dX_{t+2} is the change in the level of the variable X from year t + 2 to year t, divided by total assets in year t ($dX_{t+2} = (X_{t+2} - X_t)/A_t$). *Market Value of Firm* is the market value of the firm, which is defined as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Cash* is cash and marketable securities. *Earnings* is earnings, which is defined as earnings before extraordinary items plus interest, deferred tax credits, and investment tax credits. *A* is total assets. *R&D* is the research and development expenses. *Dividends* is dividends. *Interest Expense* is the interest expenses. *Net Assets* is non-cash assets, which is defined as total assets minus cash and marketable securities. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of *Cash* between the two sub-groups.

Panel A. Regressions

	Market Value of $Firm_t$	
	Union Membership < Median	Union Membership ≥ Median
Intercept	1.238	1.233
	(0.01)	(0.01)
$Cash_t$	1.454	1.006
	(0.01)	(0.01)
$Earnings_t$	-0.794	-0.360
	(0.01)	(0.01)
$dEarnings_t$	1.474	0.911
	(0.01)	(0.01)
$dEarnings_{t+2}$	-0.514	-0.330
	(0.01)	(0.01)
$R\&D_t$	1.027	0.919
	(0.01)	(0.01)
$dR\&D_t$	3.929	2.567
	(0.01)	(0.01)
$dR\&D_{t+2}$	3.410	2.138
	(0.01)	(0.01)
$Dividends_t$	11.152	7.618
	(0.01)	(0.01)
$dDividends_t$	-0.044	0.359
	(0.89)	(0.05)
$dDividends_{t+2}$	4.990	3.204
	(0.01)	(0.01)
Interest $Expense_t$	3.315	3.455
	(0.01)	(0.01)
dInterest $Expense_t$	-0.238	-1.640
	(0.18)	(0.01)
dInterest $Expense_{t+2}$	0.696	0.447
	(0.01)	(0.01)
$dNet\ Assets_t$	0.031	0.046
	(0.01)	(0.01)
$dNet\ Assets_{t+2}$	0.261	0.169
	(0.01)	(0.01)
dMarket Value of $Firm_{t+2}$	-0.024	-0.007
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	129215	122732
Adjusted R-square	0.36	0.29

Panel B. Difference in the Coefficients of Cash

The following table shows the difference in the coefficients of Cash between the two sub-groups separated by union membership and reports the p-value of the t-test in the parentheses.

	Cash
Difference	0.448
(p-value)	(0.01)

Table 2-10 Corporate Cash Holdings and Profitability

This table shows OLS regressions for the sub-groups separated by union membership. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. Panel A shows the regressions. ROA is defined as the ratio of EBIT to total assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Corporate Cash Holdings between the two sub-groups.

Panel A. Regressions

	ROA	
	Union Membership < Median	Union Membership ≥ Median
Intercept	-0.463	-0.198
	(0.01)	(0.01)
Corporate Cash Holdings	0.031	0.003
	(0.01)	(0.01)
Size	0.030	0.013
	(0.01)	(0.01)
Tobin's Q	0.002	0.007
	(0.01)	(0.01)
Leverage	-0.068	-0.025
	(0.01)	(0.01)
Capital Expenditure	0.061	0.040
	(0.01)	(0.01)
Dividends	0.309	2.079
	(0.01)	(0.01)
Cash Flow	-0.719	-0.237
	(0.01)	(0.01)
R&D	0.210	0.085
	(0.01)	(0.01)
Net Working Capital	-0.148	-0.135
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	177400	178315
Adjusted R-square	0.42	0.37

Panel B. Difference in the Coefficients of Corporate Cash Holdings

The following table shows the difference in the coefficients of Corporate Cash Holdings between the two sub-groups separated by union membership and reports the p-value of the t-test in the parentheses.

	Corporate Cash Holdings
Difference	0.028
(p-value)	(0.01)

Table 2-11 Corporate Cash Holdings and Labor Costs

This table shows OLS regressions about corporate cash holdings and labor costs for the sub-groups separated by union membership. We use a sample of 77380 firm-year observations from 63 countries between 1992 and 2013. Panel A shows the regressions. *Log (Average Labor Costs)* is defined as the logarithm of average labor costs, where average labor costs are the ratio of staff expenses to the number of employees. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to assets. *Size* is defined as the logarithm of market value of assets. *Leverage* is defined as the ratio of long-term debts to market value of assets. *Average Sales per Employee* is the ratio of sales to the number of employees. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Tangibility* is the ratio of plant, property and equipment to assets. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Corporate Cash Holdings between the two sub-groups.

Panel A. Regressions

	Log (Average Labor Costs)	
	Union Membership < Median	Union Membership ≥ Median
Intercept	7.193	7.630
	(0.01)	(0.01)
Corporate Cash Holdings	0.334	0.504
	(0.01)	(0.01)
Size	-0.009	0.001
	(0.01)	(0.69)
Leverage	-0.018	0.092
	(0.65)	(0.04)
Average Sales per Employee	0.464	0.428
	(0.01)	(0.01)
Tobin's Q	0.001	0.008
	(0.82)	(0.08)
Tangibility	-0.043	0.007
	(0.10)	(0.81)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	38981	38399
Adjusted R-square	0.56	0.43

Panel B. Difference in the Coefficients of Corporate Cash Holdings

The following table shows the difference in the coefficients of Corporate Cash Holdings between the two sub-groups separated by union membership and reports the p-value of the t-test in the parentheses.

	Corporate Cash Holdings
Difference	-0.170
(p-value)	(0.01)

Table 2-12 Corporate Cash Holdings and Strikes & Lockouts: Country-level Analysis

This table shows an OLS regression on the country-level analysis about Corporate Cash Holdings and Strikes & Lockouts. We convert all firm-level variables into country-level variables by taking the average of the variables across the countries. The sample includes 781 country-year observations between 1992 and 2013 from 52 countries. *Strikes & Lockouts* are defined as the total number of strikes and lockouts in a country. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Labor Force* is defined as the sum of all persons of working age who are employed and those who are unemployed. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p-value is noted in the parentheses.

	Log (Country-level Strikes & Lockouts + 1)
Intercept	9.855
	(0.01)
Country-level Corporate Cash Holdings	0.616
	(0.08)
Log (Country-level Labor Force)	-0.384
	(0.01)
Country-level Size	0.220
	(0.03)
Country-level Tobin's Q	0.043
	(0.53)
Country-level Leverage	0.544
	(0.60)
Country-level Capital Expenditure	-0.447
	(0.81)
Country-level Dividends	2.446
	(0.36)
Country-level Cash Flow	-0.437
	(0.69)
Country-level R&D	10.301
	(0.03)
Country-level Net Working Capital	1.612
	(0.07)
Country-level Cash Flow Volatility	-4.705
	(0.10)
Year Dummy Variables	YES
Industry Dummy Variables	YES
Country Dummy Variables	YES
Number of Observations	781
Adjusted R-square	0.90

Table 2-13 Robustness Check: Gender Gap

This table shows the second-stage regressions of the 2SLS estimation for the sub-groups separated by the Gender Gap. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. Panel A shows the regressions. *Gender Gap* index is from the World Economic Forum and is constructed based on the equality between women and men across four key areas: health, education, economy and politics (see text for details). *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions

	Corporate Cash Holdings	
	Second Stage of 2SLS	
	Gender Gap < Median	Gender Gap≥ Median
Intercept	3.092	4.085
	(0.01)	(0.01)
Union Membership	-1.263	-1.264
	(0.01)	(0.01)
Size	-0.130	-0.160
	(0.01)	(0.01)
Tobin's Q	0.015	0.018
	(0.01)	(0.01)
Leverage	-0.060	-0.125
	(0.01)	(0.01)
Capital Expenditure	1.192	0.739
	(0.01)	(0.01)
Dividends	3.124	2.223
	(0.01)	(0.01)
Cash Flow	-0.010	-0.601
	(0.27)	(0.01)
R&D	4.495	3.437
	(0.01)	(0.01)
Net Working Capital	-0.800	-1.146
	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.155	0.673
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	239191	116524
Adjusted R-square	0.40	0.39
Over-identifying Restrictions Test (p-value)	0.18	0.63
Hausman Test (p-value)	0.01	0.01

Panel B. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by Gender Gap and reports the p-value of the t-test in the parentheses.

	Union Membership
Difference	0.001
(p-value)	(0.94)

Table 2-14 Robustness Check: Collective Bargaining Coverage Rate

This table shows the robustness check by using Bargaining Coverage Rate as an alternative measure of bargaining power. We use a sample of 219720 firm-year observations from 55 countries between 2000 and 2013. Panel A shows the determinants of the Corporate Cash Holdings. We report the OLS regression and the second stage of two-stage least square estimation. *Corporate Cash Holdings* is defined as the ratio of cash and marketable securities to non-cash assets, where non-cash assets is calculated as total assets minus cash and marketable securities. *Collective Bargaining Coverage Rate* is calculated as the number of employees whose pay and/or conditions of employment are determined by one or more collective agreement(s) in a country divided by the total number of employees in that country. *Size* is defined as natural logarithm of non-cash assets. *Tobin's Q* is defined as market value of equity plus non-cash assets minus book value of equity, divided by non-cash assets. *Leverage* is defined as the ratio of long-term debts to non-cash assets. *Capital Expenditures* is defined as the ratio of capital expenditures to non-cash assets. *Dividend*s is defined as the ratio of dividends to non-cash assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by non-cash assets *R&D* is defined as the ratio of research and development expenses to non-cash assets. *Net Working Capital* is defined as the ratio of working capital minus cash and marketable securities to non-cash assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p-value is noted in the parentheses.

Panel B shows OLS regressions about the market value of corporate cash holdings for the sub-groups separated by Collective Bargaining Coverage Rate. We use a sample of 163788 firm-year observations from 55 countries between 2000 and 2013. For each independent variable Xt is the level of the variable X in year t, divided by total assets in year t. dXt is the change in the level of the variable X from year t - 2 to year t, divided by total assets in year t ($dXt = (Xt - Xt-2)/At$). dXt+2 is the change in the level of the variable X from year t + 2 to year t, divided by total assets in year t ($dXt+2 = (Xt+2 - Xt)/A\neg t$). *Market Value of Firm* is the market value of the firm, which is defined as the sum of the market value of equity, the book value of short-term debt, and the book value of long-term debt. *Cash* is cash and marketable securities. *Earnings* is earnings, which is defined as earnings before extraordinary items plus interest, deferred tax credits, and investment tax credits. *A* is total assets. *R&D* is the research and development expenses. *Dividends* is dividends. *Interest Expense* is the interest expenses. *Net Assets* is non-cash assets, which is defined as total assets minus cash and marketable securities. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p-value is noted in the parentheses. Panel C shows the difference in the coefficients of Corporate Cash Holdings between the two sub-groups. The p-value is noted in the parentheses.

Table 2-14 (Continued)

Panel A. Collective Bargaining Coverage Rate and Corporate Cash Holdings

	Corporate Cash Holdings	
	OLS	The Second Stage of 2SLS
Intercept	3.321	3.450
	(0.01)	(0.01)
Collective Bargaining Coverage Rate	-0.234	-1.063
	(0.01)	(0.01)
Size	-0.139	-0.140
	(0.01)	(0.01)
Tobin's Q	0.022	0.021
	(0.01)	(0.01)
Leverage	-0.146	-0.159
	(0.01)	(0.01)
Capital Expenditure	1.038	1.050
	(0.01)	(0.01)
Dividends	2.325	2.367
	(0.01)	(0.01)
Cash Flow	-0.362	-0.362
	(0.01)	(0.01)
R&D	3.870	3.842
	(0.01)	(0.01)
Net Working Capital	-1.028	-1.032
	(0.01)	(0.01)
Industry Cash Flow Volatility	0.426	0.414
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	290565	290565
Adjusted R-square	0.41	0.41
Over-identifying Restrictions Test		0.31
Hausman Test		0.01

Table 2-14 (Continued)

Panel B. Market Value of Cash - Regressions

	Market Value of Firm$_t$	
	Collective Bargaining Coverage Rate < Median	Collective Bargaining Coverage Rate ≥ Median
Intercept	1.462	1.134
	(0.01)	(0.01)
Cash $_t$	1.485	1.054
	(0.01)	(0.01)
Earnings $_t$	-0.754	-0.361
	(0.01)	(0.01)
dEarnings $_t$	1.548	0.737
	(0.01)	(0.01)
dEarnings $_{t+2}$	-0.518	-0.338
	(0.01)	(0.01)
R&D $_t$	0.995	0.891
	(0.01)	(0.01)
dR&D $_t$	4.029	2.299
	(0.01)	(0.01)
dR&D $_{t+2}$	3.303	1.854
	(0.01)	(0.01)
Dividends $_t$	10.746	9.014
	(0.01)	(0.01)
dDividends $_t$	0.758	0.079
	(0.04)	(0.64)
dDividends $_{t+2}$	4.970	3.617
	(0.01)	(0.01)
Interest Expense $_t$	3.192	1.620
	(0.01)	(0.01)
dInterest Expense $_t$	-0.065	0.506
	(0.74)	(0.01)
dInterest Expense $_{t+2}$	0.653	0.625
	(0.01)	(0.01)
dNet Assets $_t$	0.030	0.065
	(0.01)	(0.01)
dNet Assets $_{t+2}$	0.261	0.184
	(0.01)	(0.01)
dMarket Value of Firm $_{t+2}$	-0.018	-0.021
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	111493	106870
Adjusted R-square	0.37	0.34

Panel C. Market Value of Cash - Difference in the Coefficients of Cash

The following table shows the difference in the coefficients of Cash between the two sub-groups separated by Collective Bargaining Coverage Rate and reports the p-value of the t-test in the parentheses.

	Cash
Difference	0.431
(p-value)	(0.01)

Chapter 3 Labor Unions and Dividends: Evidence from International data

3.1 Introduction

Labor union represents the benefits of workers strengthen the bargaining power of employees in collective bargaining. The presence of labor unions has impacts on firms' financial policies. For example, Freeman (1986) suggests that some firms take costly measures to prevent union organizing and hiring consultants. Several other measures are also taken to improve bargaining benefits, such as underfunding pension plans (Ippolito 1985). Furthermore, firms strategically use financial policies as bargaining tools against labor unions. For instance, firms tend to lower liquidity in their balance sheet to gain better bargaining positions. Bronars and Deere (1991) state that firms strategically increase leverage to shelter income by issuing debt rather than increasing labor wages when there are labor unions. Further, Matsa (2010) finds that a firm with the external finance constraints has an incentive to use the cash flow demands of debt service to improve its bargaining position with workers

In this chapter, we study the relation between labor unions and dividends in the international setting. Our paper is motivated by the following three reasons. First, dividend policy is an essential corporate policy in the international setting. Pinkowits, Stulz and Williamson (2006) argue that firms in countries with poor investment protection pay dividends to get more private benefits by using international data from 35 countries. Payout dividends reduce the financial resources available to a firm, which also reduces the resources available for potential collective bargaining organized by labor unions. It implies that a firm may strategically choose corporate dividend policy with the presence of labor unions. For example, suppose a firm has a lot of cash holdings, labor unions recognize this and may organize the collective bargaining to get more benefits for the workers. Then suppose a firm pays out the

cash by using dividends, this reduces cash holdings in the firm and can reduce the likelihood of the occurrence of the collective bargaining organized by labor unions.

Second, previous literature has examined how labor unions affect dividends by using the US data. For example, (e.g., Chen et al., 2015; He et al., 2016; Chino, 2016). Since labor unions exist in many countries around the world, the previous literature has found that there is a substantial difference between US and other countries in the world. For example, Visser (2006) examines the data of labor unions in 24 countries, and finds that the union density ranges from 8.1% to 78.0% in 2001. Among them, the union density in the US is 12.8%, ranking at the 22nd place. It implies that the unionization rates between the US data and the international data are significantly different. Therefore, if we use the international data of labor unions, there will be a larger cross-section variation in the data. This can provide a more effective research setting on the relation between labor unions and dividends. This motivates us to conduct the research in the international setting.

Third, the previous literature has found different results in terms of the relation between labor unions corporate financial policies by using US data and international data separately. For example, Matsa (2010) uses the US data and finds that there is a positive relation between the strength of labor unions and leverage with the presence of external financial constraints, and he interprets the results as the supporting evidence for the bargaining hypothesis. However, Simintzi, Vig and Volpin (2015) find the opposite results with the international data. They find that there is a negative relation between union density and leverage, and argue that this is not consistent with the theory of debt as a bargaining tool. Instead, they argue that the employment protection increases operating leverage and crowds out financial leverage. Therefore, it is possible that the impact of labor unions on corporate policies are different between the US data and the international data. This motivates us to examine the relation between labor unions and dividends in the international setting.

We develop two hypotheses. First, the bargaining hypothesis argues that firms strategically choose dividends to gain the bargaining advantage against labor unions. On one hand, when a firm has a higher payout, this can increase the risk of the shortage of corporate liquidity. As a result, labor unions will decrease their demands for benefits from the firm due to the consideration of bankruptcy risk. On the other hand, suppose a firm has higher dividends, this may send out a positive signal about future profitability. Moreover, this may also reveal that the firm is less financially constrained. To avoid this positive signaling situation which may increase the likelihood of the occurrence of collective bargaining organized by labor unions, a firm will reduce the dividends to prevent sending out this kind of positive signals. Therefore, the bargaining hypothesis can affect the relation between labor unions and dividends in two possible directions through two different mechanisms.

Second, the operating leverage hypothesis suggests that stronger labor unions increase both operating risk and rigidity of labor costs, and that these two effects lead to dividends based on the trade-off perspective. Suppose a firm has stronger labor unions, the firm will have higher expenditures due to the higher rigidity of labor costs. According to the trade-off perspective, the firm needs to hold more cash to meet the demand of higher expenditures. Moreover, stronger labor unions are also associated with a higher operating risk. According to the trade-off perspective, the firm also needs to hold more cash due to the precautionary motive. In this case, the firm will reduce the dividends to accumulate corporate cash holdings. Therefore, the operating leverage hypothesis predicts that there is a negative relation between the strength of labor unions and dividends.

We use a sample of 355715 firm-year observations from 66 countries in our empirical analysis. We use the country-level union membership to measure the bargaining power of labor unions across countries that is defined as total number of trade union members to the total number of paid employees in a country. In terms of the potential endogeneity problem, we

apply the instrumental variables approach in our analysis to study the relation between union membership and dividends. In addition, we conduct the relevant tests to ensure our instruments are valid and exogenous.

We find that firms use dividends to gain bargaining position to labor unions. When there is higher union membership in a country, firms tend to pay more dividends. Our results show that a one standard deviation increase in the country-level union membership leads to a 0.019 increase in the level of dividends payout, corresponding to an increase in dividends with a dollar value of 3.033 million dollars. In addition, we divide our sample into sub-groups concerned with characteristics that can affect the bargaining power of labor unions. We find that the positive relation between country-level union membership and dividends is stronger for firms in countries with weaker employment protection legislation and for firms in countries with a higher degree of labor bargaining centralization.

Because of this positive relation, we conduct event study about how the country-level union membership affects the around the date of dividend change. We find that the announcement return is higher for firms in a country with higher union membership around the announcement date of dividend increase, and lower for firms in a country with lower union membership around the announcement date of dividend decrease. Moreover, we examine how labor unions affect the operating performance around the event of dividend changes. We find that the net ROA change is positively correlated with the union membership around the event date of dividend increase, and negatively correlated with the union membership around the event date of dividend decrease.

Our findings are consistent with the bargaining hypothesis from the perspective of the availability of resources. They imply that a strategically choose dividends to gain bargaining advantage against labor unions in the international setting.

Our paper makes several contributions. First, the existed paper show that there are mixed results of the study about the relation between dividends and labor unions. Chen et al (2015) find that the likelihood of share repurchases are lower when the labor power from labor unions are stronger, because firms tend to avoid the higher leverage ratios with US data. He et al. (2016) use the election data and find that a firm's payout ratio is lower in the following years after the union election passes than the firms fail in the union election. However, Chino (2016) argue that there are significant heterogenous effects of unionization on payout, and these effects are negative for low-profitability firms and positive for high-profitability firms. Due to these different results, we conduct analysis with international data and find labor unions generally increase dividends because unions play an essential role in the collective bargaining.

Second, our research extends the literature on dividends in the international setting. There is a large literature on dividends using US data, European data and international data. Among the previous papers that use international data, Chay and Suh (2009) and Hoberg and Prabhala (2009) find out a negative relation between dividend payout and future cash flow in U.S. and international markets. Pinkowitz, Stultz and Willianms (2006) find that shareholders pay out dividends to gain private benefits in a country with poor investor protection across 35 countries. La Porta et al. (2000) use data from 33 countries to test the agency model of dividends. They argue that the stronger minority shareholder rights are associated with higher dividend payouts. To our knowledge, no previous paper has examined the relation between labor unions and dividends in the international setting.

This chapter is organized as follows. Section 2 develops the hypotheses. Section 3 describes the data and the variables. Section 4 discusses the methodology. Section 5 presents the results of large sample analysis. Section 6 shows the results of smaller sample analysis. Section 7 describes robustness check. Section 8 concludes the paper.

3.2 Literature Review

We review the comprehensive literature about dividends in this section.

Since Allen and Michaely (2003); DeAngelo, DeAngelo and Skinner (2008); Mensa, Michaely and Schmalz (2016) have already review the existing literature about dividends from 1956. We aim to review the literature only relative to our study about labor unions and dividends, instead of demonstrating a complete literature review of the whole history about dividends development. Therefore, this section focuses on the signaling theory and agency theory which is relevant to our research and review little literature about the tax effects.

The seminal study about dividends is established by Lintner (1956), and Miller and Modigliani (1961). Lintner (1956) interview 28 listed companies with different financial characteristics about the corporate dividend decisions. He demonstrates three main findings: first, firms set a stable dividend policy and adjust the policy suppressed to previous dividend payments when necessary. Second, firms' earnings are the most critical determinant of change in corporate dividend policy. Third, firms tend to smooth the dividend policy and prefer to change other financial policies rather than adjust the dividend payments. Accordingly, Lintner develop the partial adjustment model to describe the determinants of dividend payments, which is widely used in subsequent study about corporate dividend policy. For example, Fama and Babiak (1968) conduct various test on Lintner's partial adjustment model by using the data of 392 major industrial firms from 1946 to 1964. They find evidence that Lintner's model performed well in dividend prediction for individual firms. Moreover, Allen, Bernardo and Welch (2000) find evidence supporting the dividend smoothing idea when they study firms' ownership of institutional investors. Since institutional investors are more favour of stocks paying dividends because they have more information about firms' quality than individual investors. If a firm mitigates dividend payments, it leads to institutional investors loss because institutional investors are more sensitive to dividends decrease than individual investors.

Recently, Leary and Michaely (2011) show that the smoothing trend of dividend payments is increasing in US companies since the 1930s. Since share repurchases accounting for a substantial proportion of firms' payout policy in the past two decades, there are less dividend changes after the popularity of share repurchase. Dewenter and Warther (1998), and Michaely and Roberts (2012) provide more evidence from Japan and UK separately.

Before Miller and Modigliani (1961)[27], economists believed that higher dividend payments are associated to higher value of firms. For example, Gordon (1959) claims that the value of a firm is determined by the dividend payment in the next year and investors' required rate of return. Miller and Modigliani (1961) first propose that a firm's dividend policy is irrelevant to the value of this firm in a perfect and complete capital market. Instead, firms' value is affected by the optimal investment. They emphasize that investors can create their own homemade dividend policy by trading equity properly, because there is a tradeoff between dividends at two individual dates. Therefore, the net dividends are concerned as the residual of the return of investment and retained earnings for the future growth opportunities.

However, MM's model is based on the assumptions of perfect markets with no taxes, symmetric information, no transaction costs, complete markets and no agency problems. Obviously, stock price reacts to dividend changes in real world. Subsequent economists raise various issues about relaxing these assumptions and conduct intensive studies about dividend policies in the real world. For example, Black (1976) includes tax and transaction costs in his analysis and introduces two puzzles about the dividend irrelevance theory: why firms pay substantial dividends and why investors buy stocks of firms paying dividends?

Over decades of studies, financial economists propose two main theories about firms' dividend policy: signaling theory and agency theory.

[27] Thereafter, this paper abbreviates Miller and Modigliani as MM.

3.2.1 Signaling theory

Since Lintner (1956) propose that firms tend to smooth the dividend payments, dividend change is considered as a signal of firms' prospects. Besides, unlike the assumption in Miller and Modigliani (1961), capital markets are imperfect, there is information asymmetry problems between investors and insiders. Managers use dividend policy as a signal to convey information about future profitability to shareholders. Therefore, signaling theory predict a positive relation between dividends and firms' future profitability.

There is amber literature provides theoretic supports to signaling theory. For example, Bhattacharya (1979) theoretically analysis the signaling effects of managers on investors in imperfect markets with asymmetry information problem. He argues that dividend payments are costly in that paying dividends leads to extra transaction costs; only good firms send signals to investors by dividend payments while bad firms cannot afford these signals. It inspires investors to believe firms announcing higher dividends are associated higher market value. Moreover, John and Williams (1985) note that managers have superior information than investors under the assumption of taxed dividends. Investors increase their ownership of these firms only when their benefits from firms' future better performance are high enough to cover the costs of tax. In equilibrium of their signaling model, firms optimally increase dividends when mangers expect higher future cash flows which provide benefits more than the costs. Another essential theoretical model of signaling theory comes from Miller and Rock (1985), they include the distortion costs of investments in his study as the extra costs of dividend payments which are used to signaling firms' profitability. They show that firms invest in projects and then use the cash flow from these projects to finance dividend payments and other new investments.

Financial economists also conduct empirical studies on the signaling theory, but they find mixed results. Some researchers find no or modest relation between dividends and earnings growth that does not support the signaling theory effectively. For example, Watts (1973) tests

the hypothesis that dividend policy predicts future earnings over the sample of dividend payments in 310 firms between 1946 and 1968. He finds that the magnitude of future earnings changes related to dividends changes is small, although the coefficient is positive.[28] Moreover, Benartzi, Michaely and Thaler (1997) show that dividend changes are associated with earnings changes in current year and last year, while future earnings in firms whom do not change dividends are more likely to decrease than in firms whom increase dividends.

Some literature even finds opposite results of signaling theory. For example, Benartzi, Michaely, and Thaler (1997) find firms' earnings increases after dividend cuts in following two years. Healy and Palepu (1988) also find similar results. Grullon, Michaely and Swaminathan (2002) find that both future earnings and firms' profitability decrease after dividend increases. DeAngelo, DeAngelo and Skinner (1996) investigate 145 firms listed in NYSE whom experienced consecutive earnings growth for more than nine years and then stop to decline in it. They show that 68.3% of firms increase dividends in the year that the firms' earnings start decreasing because managers still expect earnings growth in future. They argue that dividend changes do not convey reliable information of future earnings and dividend changes are not useful signals to outside investors.

There are also literauture find empirical evidence supporting the signaling theory. For example, Brickley (1983) selects 35 firms with dividends increases more than 20% and construct a sample to test the relation of earnings growth and dividend changes. He finds significant earnings growth in the year and after the year of dividend increase. Healy and Palepus (1988) also find significant increase in earnings in the following two years of dividend initiates while decrease in earnings after omitting dividend payments with a small sample of 172 firms. Moreover, Kaestner and Liu (1998) also find consistent results with signaling theory.

[28] Gonedes (1978), Penman (1983), Benartzi, Grullon, Michaely, and Thaler (2002) find the similar results or insignificant relation.

They find the size of dividend payments is the most important determinant of the variation of firms' stock price responding to the signal of the dividend announcement. Recently, Guay and Harford (2000); Jagannathan, Stephens and Weismach (2000); Nissim and Ziv (2001); Koch and Sun (2004) and Lie (2005) support the signaling theory with consistent empirical results over larger samples. For example, Nissim and Ziv (2001) demonstrate strong signaling effects of dividend announcements on firms' earnings changes over a sample of 10,666 observations. However, Grullon, Michaely, Thaler, and Benartzi (2005) argue that it is more rationale to use the nonlinear patterns with Fama and French (2000) model in the measure of earnings, rather than the mean reversion which is used by Nissim and Ziv (2001). They find there is no relation between dividend changes and future earnings and suggest that dividend increase is not a reliable signal of firms' future profitability. Therefore, the overall accumulated literature about signaling theory on future earnings is still controversy.

The literature on the market response to the dividend signaling is enormous. Michaely, Thaler and Womack (1995) examine the market reactions to the initiates and omissions of dividend payments over all NYSE listed firms from 1964 to 1988. They find that the stock price increases over 3% after the initiates and decreases 7% after omissions, these changes are stronger than the stock price changes after earnings changes. Benartzi, Michaely, and Thaler (1997) show that there is significant abnormal return in the year before the dividend changes with and in the next three years after the dividend changes. Firms have -28.1% (8.6%) abnormal return in the previous one year of dividend cuts (increase), and they have -15.3% (8.0%) cumulative abnormal return in following three years after dividend omissions (increase). Grullon, Michaely and Swaminathan (2002) also find similar results over another sample period of 1967-1993. It is controversy that dividend policy signals the future information as signaling theory suggested or the past information.

In sum, there is no officially accepted signaling model because it is difficult to find a model which can explain all the mixed results.

3.2.2 Agency theory

Modigliani and Miller (1961) assume that there is no agency problem in the perfect markets and prop that only investments affect firms' value. However, there are conflicts of managers' interests and shareholders' interests in our real world which lead to agency costs from cash distribution.[29] Dividend policy is no longer irrelevant to firms' value that can be used to lower the cash reserves that lower agency costs. Therefore, agency theory predicts a negative relation between dividends and agency costs.

Financial economists study the agency theory of dividend policy with theoretical analysis. For example, Easterbrook (1984) propose two sources of agency costs of dividends: the monitoring of managers and the risk aversion on the part of managers. He explains that managers are risk averse, and they tend to invest in safe projects with lower risks and lower returns while shareholders prefer to take risky projects for higher expected return. He argues that dividend payments can reduce both these two costs. In terms of monitoring costs, when firms' internal funds are payout as dividends, managers seek external funds to finance projects. Consequently, more relevant participants in the process of external financing such as creditors will monitor managers' behavior. In terms of risk aversion issue, dividends mitigate managers' risks by encouraging the equity financing. In the two lines, dividend payments lower the agency costs. Jensen (1986) develops the free cash flow hypothesis about the agency problems associated to dividend policy. In free cash flow hypothesis, he argues that the surplus after financing profitable projects becomes free cash flow which lead to agency problems. He

[29] Jensen and Meckling (1976) propose the agency problem from the conflicts between managers and shareholders and develop the free cash flow hypothesis.

highlights the benefits of paying dividends because dividend payments decrease the free cash flow after investments.

Financial economists produce abundant empirical papers on the agency theory. For example, Rozeff (1982) state that there is a tradeoff between the lower agency costs and the higher transaction costs of external financing when firms raise dividends. Firms pursue the optimal dividends with minimum total costs of agency problems and transaction of external funds. Llyod, Jahera and Page (1985) include firms' size in Rozeff's (1982) tradeoff model by using the data of 957 US firms in 1984. Their results are consistent to Rozeff (1982) and they argue that size is also very important in the analysis of dividend policy. Rao and White (1994) apply the data of 66 private US firms in the tradeoff model to study the agency theory in private firms. They find consistent results and argue that it is because private firms also are under monitoring of bankers, accountants and so on.

Moreover, La Porta et al. (2000) use two models to examine the relation of dividends policy and agency costs over a sample of 4103 firms from 33 countries. In the outcome model, dividends are the outcome of the better legal protection to investors who can claim dividends from managers. In the substitute model, dividends are the substitute for effective legal protection and firms with in a country with more moral hazard will pay more dividends to gain reputation among investors for future financing demands. Their findings add evidence of agency theory from international data.

Inspired by La Porta et al. (2000), subsequent researchers pay more attention to the relation of dividend policy and governance mechanisms. For example, Fenn and Liang (2001) examine the management ownership and payout policy by using a sample of 1100 nonfinancial firms from Standard & Poor's 1500 in a period of 1993 to 1997. They find a positive relation between the management ownership and dividend payments and argue that firms use dividend policy to lower the agency problems of free cash flow. Grinstein and Michaely (2005) examine

the relation between the institutional ownership and payout policy in US listed firms during the sample period of 1980-1996. They find institutional investors prefer firms have dividend payments rather than firms do not pay dividends. However, they find no evidence that the level of dividends is associated with institutional ownership. In addition, Michaely and Roberts (2012) provide evidence supporting agency theory from UK firms when they compare the dividend smoothing phenomenon in public firms and private firms. They find public firms pay more dividends than private firms, because there are more agency problems in public firms.

More recently, Acharya and Lambrecht (2013) examine the income and payout smoothing when there is asymmetry information between investors and managers. Although managers set a smooth dividend policy to meet shareholders' demands, they tend to decrease the future expectation of income by distorting production when they have more information about firms' income. The level of underproduction problem is negatively related to the management ownership. Lambrecht and Myers (2012, 2017) present a dynamic model to test the interaction among investments, payout policy and debt. They assume that managers are risk averse, so that firms are underinvested because the agency problem between shareholders and managers.

Financial economists also apply the agency theory in the empirical research linking firms' dividend policy to nonfinancial stakeholders such as labor unions. However, early studies find modest effects of labor unions on dividend policy. For example, DeAngelo and DeAngelo (1990, 1991) conduct case studies about the labor concessions in US firms and find weak evidence that firms may decrease dividend payments to extract wage concessions from collective bargaining with labor unions. In addition, Matsa (2006) find insignificant relation between unionization rate and firms' dividends. Chino (2015) state that the relation between labor unions and payout policy is determined by firms' profitability. He finds labor unions have negative effects on firms with low profitability and have positive effects on firms with high

profitability. He argues that his results support the agency theory that firms payout dividends to prevent agency problems when there are internal liquidity reserves in firms with high profitability.

3.2.3 Other theories

3.2.3.1 Residual theory

According to Miller and Modigliani (1961), firms pay out dividends after their cash flows satisfy all financing demands of profitable investments. In this line, dividends can be viewed as the residual of earnings and investments. Firms first guarantee the financing demands of investments, then they set dividend policy with the remaining cash flows. The residual theory implies that firms strategically cut dividends to finance investments. Therefore, the residual theory predict that investments have negative effects on firms' dividend policy.

There are some literature supporting the negative relation. For example, Alli, Khan, and Ramirez (1993) test the relation between firms' capital expenditure and dividend policy and find that dividends are negatively associated with capital expenditure. They argue that their results are consistent with the residual theory. For another example, Slater and Zwirlein (1996) find, within a sample consisting of S&P 400 Industrial Index firms between 1986 and 1989, that dividend payout is negatively related with investment.

The costs of external financing present an explanation for the negative effects of investments on dividends. In line of financing hierarchy theory, external financing is costly and will reduce firms' value. Firms reduce dividends to avoid the costs of external financing. For example, Fama and French (2001, 2002). In Fama and French (2001), they observe a significant drop from 66.5% in 1978 to 20.8% in 1999 for the proportion of US firms who pay cash dividends. This is because that the new firms with low profitability but more growth opportunities account for increasing proportion of the listed firms. These newly listed firms seldom pay dividends because they have so many profitable projects that they are lack of

liquidity to do so. In another paper, Fama and French (2002) exploit the relation of dividends and debt to test the trade-off theory and pecking order theory. They find that firms pay out more dividends when there are less profitable projects and less growth opportunities because firms have incentives to avoid costly external finance, which is consistent with the financing hierarchy theory.

More empirical paper combines the residual theory with the agency theory, because the negative effects of investments on dividends as predicted in residual theory are associated with lower agency costs. For example, Lang and Litzenberger (1989) use Tobin's Q as a measure of the overinvestment to test the market response to the dividend announcements between 1979 and 1984. They find that firms with Q<1 who have less growth opportunities corresponding to lower agency problem react with higher abnormal return on dividend announcement than firms with Q>1 who have more growth opportunities and severe agency problems. Grullon, Michaely and Swaminathan (2002) present that higher dividend payments reduce firms' systematic risk and firms' capital expenditures decrease in the year after the dividends increase over the sample period of 1967-1993. They suggest that firms end the growth process and reach the maturity stage with less investment opportunities and more free cash flows, so that firms increase dividends to decrease free cash flows in that these surplus cash leads to agency costs. Michaely and Roberts (2012) also provide evidence from private firms by using data from UK firms. they find private firms set dividend policy after their investment decisions have been made.

However, recent studies show that dividends are not the simply the residual of cash flows after satisfying the investments demands. For example, Brav, Graham, Harvey, and Michaely (2005) survey 384 managers to understand the managers' motives of making payout policy decisions. They argue some managers even give up profitable investments before they cut dividends and dividends are not the residual.

3.2.3.2 Executive stock option hypothesis

According to the formula of Black and Scholes (1973), dividend policy affects the price of stock options, because the underlying stock price decreases after the dividend payments. As a result, managers have the incentive to reduce dividends to protect their own wealth of stock options. Accordingly, the executive stock option hypothesis predicts a negative relation between managerial stock options and dividends. For example, Lambert, Lanen and Larcker (1989) investigate how initial adoption of stock options for executives affect firms' dividend policy by using the data of 221 US firms who adopted options since 1949. They find that the higher current dividend payments will decrease the expected dividends in the future. This motives managers who have stock options to reduce dividends to protect their own wealth with the adoption of stock options for executives.

3.2.3.3 Catering hypothesis

The above research assumes that people are rational to make financial decisions, however, behavior finance suggests that people have irrational behaviors and provide another explanation of dividend policy.[30] For example, based on the self-control theory proposed by Thaler and Shefrin (1981) and Shefrin and Statman (1984), Barberis and Thaler (2003) propose an open question regarding why investors are happy to accept the dividend policy given that a higher tax rate is associated with dividend than capital gain tax rate associated with repurchase. One of the explanations proposed by the behavior finance is that investors have self-control problem so that they prefer dividends to deal with their self-control problem. Barberis and Thaler (2003) state that dividend payments can help people "only consume the dividend, but don't touch the portfolio capital".

[30] We focus on the theories of dividends based on the assumptions that people are rational throughout the dissertation. Here we briefly review the behavioural perspective of dividends.

Baker and Wurgler (2004) propose the catering hypothesis of dividends by using the US data over a period of 1962-2000. They find that managers pay dividends to cater to investors' preference. They argue that when investor put a stock premium on dividend payers, firms pay dividend to cater to such demand of investors. However, when an investor prefers non-dividend payers, firms do not pay dividend.

3.2.4 Tax

There is an extensive traditional literature about the tax perspective for dividends. Various theories have been proposed in this literature. However, Brav, Graham, Harvey and Michaely (2004) argue that tax plays only of second importance in the role of determining firms' dividend policy, so we don't focus on the tax effect in our study, we only briefly review the literature about tax.[31] For example, Miller and Modigliani (1961) propose the clientele effects from the tax perspective for dividends. They argue that investors choose firms with different dividend policies according to their different marginal tax rates. Miller and Scholes (1978) develop a dynamic model of the tax clientele effect on dividends. Subsequently, Kalay (1982) conduct an empirical test of this model by using the data of ex-dividend day stock price with a sample of 2,540 cash dividends payments between 1966 and 1967 and argue that the results are consistent with tax induced clientele effect of MM model.

3.3 Hypothesis

We develop the hypotheses in this section.

3.3.1 Bargaining hypothesis

We argue that labor unions can affect dividends from the bargaining perspective through two channels.

[31] Following a large number of papers in the literature (e.g. Black, 1976; Allen, Bernardo and Welch, 2000; Chino, 2016), our study focuses on the signaling theory and agency theory which is relevant to our research. See the survey paper of Allen and Michaely (2003), and DeAngelo, DeAngelo and Skinner (2008) for more literature.

3.2.1.1 The channel through the availability of resources and bankruptcy risk

It has been found in literature that corporate financial policies are affected by the collective bargaining. For example, it has been recognized widely that leverage is affected by potential bargaining between a firm and labor unions (e.g., Baldwin, 1983; Bronars and Deere, 1991; Perotti and Spier, 1993; Matsa, 2010). In terms of other corporate financial policies, Klasa, Maxwell and Ortiz-Molina (2009) find that corporate cash holdings are affected by the bargaining power of labor unions. In this literature, the common rationale is that when a firm increases its bankruptcy risk through various corporate financial policies, this can strengthen a firm's bargaining position because the bankruptcy is costly for employees. As a result, employees will accept the lower wage with either the increase in leverage or the reduction in cash holdings.

A firm can reduce the availability of resources through increasing or decreasing dividend payments. Guay and Harford (2000) find that firms increase dividends when they experience relatively permanent cash-flow shocks. This change in dividends affect the financial resources available for bargaining between firms and labor unions over a longer period. Moreover, Jagannathan, Stephens and Weisbach (2000) find that dividend policy is a non-flexible policy that affect the future financial resources. It also strengthens the bargaining power of firms in future collective bargaining with labor unions. When a firm pays more dividends, this also increases the bankruptcy risk which plays an important role in the collective bargaining as indicated in the above rationale. For example, Chino (2016) finds that firms with higher profitability has a higher payout with the presence of strong labor unions, and argues that this is consistent with the rent extraction hypothesis that firms use payout policies to reduce the rent extracted by potential collective bargaining of labor unions. Following this mechanism, we expect that when the labor unions has strong bargaining power, a firm will increase the

dividends due to the consideration from the bargaining perspective. Therefore, we have the following hypothesis.

Hypothesis 1A: The bargaining hypothesis predicts that there is a positive relation between labor unions and dividends through the channel of availability of resources and bankruptcy risk.

3.2.1.2 The channel through the signaling effect

It has been extensively discussed in the literature about the signaling role of dividends. Vermaelen (1981) argues that firms can use share repurchases to signal future profitability. Miller and Rock (1985) find that firms use the decrease in dividend to signal investment opportunity. In this literature, a firm can send out credible signals through change in dividends.

Moreover, it has been widely recognized in the corporate finance literature that dividend payments are related with a firm's financial constraints. For example, Fazzari, Glenn, and Bruce. (1988) use the dividend payments of a firm to measure the degree of financial constraints. For other examples, Campello, Graham, and Harvey (2010); Hadlock and Pierce (2010) also use dividend payments as a measure of financial constraints.

When a firm increases dividend payments, labor unions may view this as a signal of positive future profitability or a lower degree of financial constraints due to the above mechanisms. In this case, labor unions will increase the demand of resources from the firm because they will think that the firm either has good potential of future profitability or a lower degree of financial constraints.

By foreseeing this mechanism, a firm will reduce the dividend payments to avoid the above situation where the dividend payments send out a signal to encourage the higher demand from labor unions. We expect that this situation is more likely to occur with the presence of stronger labor unions, because it will be more likely for stronger labor unions to organize

collective bargaining after viewing the dividends change as a signal. Therefore, we have the following hypothesis.

Hypothesis 1B: The bargaining hypothesis predicts that there is a negative relation between labor unions and dividends through the channel of signaling.

3.2.2 Operating leverage hypothesis

Labor unions try to increase their benefits from firms' operating income. Firms increase labor costs because of the threats from labor unions. It leads to higher operating leverage. Chen, Kacperczyk, and Ortiz-Molina (2011) find evidence that the presence of labor unions decreases the operating flexibility and increases cost of equity of firms.

The higher union membership increases the operating risk of a firm, so this firm have to keep some financial resources. Simintzi, Vig and Volpin (2015) find that the higher union density is associated to higher labor costs which increases the higher operating leverage and lower financial leverage. Furthermore, He et al. (2016) find firms tend to keep a lower payout ratio in order to give signals labor force that firms prefer to finance investment rather than pay out to shareholders.

If a firm has more dividend payments, it may have insufficient financial resources to withstand the operating risk. Given this operating leverage risk from labor unions, we expect that a firm will pay out less dividends when there is higher union membership.

Hypothesis 2: The operating leverage hypothesis predicts that there is negative relation between labor unions and the dividend payments.

3.2.3 Combining the hypotheses

We use the following table to show the hypotheses developed above. In the table, a positive sign "+" indicates a positive relation between the strength of labor unions and the dividends, while a negative sign "–" indicates a negative relation.

The relationship between the strength of labor unions and the dividends		
The bargaining hypothesis		The operating leverage hypothesis
The availability of resources	The signaling effect	
+	−	−

3.4 Data and Variables

We describe data and variables in this section.

3.4.1 Data

We get the data from the following sources. We use Compustat North America database to get the financial data for US and Canadian firms. We use Compustat Global database to get the financial data for firms in other countries. We get the stock return data from the CRSP database for US and Canadian firms. We get the stock return data from Datastream database for firms in other countries. We also get the data of stock market index in each country from Datastream database. We convert the data in foreign currencies to the corresponding data in U.S. dollars by using the monthly exchange rates from Compustat Global database. We get the country-level data of union membership from ILOStat database maintained by International Labor Organization.

The sample period is from 1992 to 2013. The data starts from 1992 because we need to use the data in the prior five years to calculate the industry cash flow volatility, while the data in Compustat Global database starts from 1987. We follow the literature (e.g., Pinkowitz, Stulz and Williamson, 2013) and exclude firms with less than 5 million U.S. dollars in total assets or market capitalization. We also follow the literature and exclude financial firms (SIC codes between 6000 and 6999). We exclude the observations with incomplete data. Our final sample consists of 42777 firms with 355715 firm-year observations from 66 countries.

3.4.2 Variables

3.4.2.1 Union Membership

We construct a variable Union Membership to measure the bargaining power of labor unions in each country. The variable is equal to the ratio of total number of trade union members

to the total number of paid employees in a country. A higher level of this variable indicates a stronger bargaining power of labor unions in a country.

3.4.2.2 Dividends

The variable Dividends is defined as the ratio of dividends to assets.

3.4.2.3 Control Variables

We include control variables as follows. We use natural logarithm of total assets as a measure of Size. We calculate the variable Tobin's Q as market value of equity plus total assets minus book value of equity, divided by total assets. We use the ratio of long-term debts to total assets as a measure of Leverage. We use the ratio of capital expenditures to total assets as a measure of Capital Expenditures. We define the variable Cash Flow as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by total assets. We use the ratio of research and development expenses to total assets as a measure of R&D. We calculate the variable Net Working Capital is calculated as the ratio of working capital minus cash and marketable securities to total assets. Industry Cash Flow Volatility is calculated as the standard deviation of the median of Cash Flow in an industry classified by two-digit SIC codes in the prior 5 years. We also include year dummy variables, industry dummy variables and country dummy variables in our regressions. We include the country dummy variables to control the time-invariant characteristics in different countries. As discussed in Chapter 2, other country variables, such as shareholder rights and so on, have already been controlled by the country dummy variables.

3.5 Methodology

We discuss the method to mitigate the potential endogeneity problem in this section. We use the instrumental variables approach.

3.5.1 Discussion about potential endogeneity problem

We argue that the endogeneity problem can stem from the reverse causality problem. For example, suppose firms in a country generally pay more dividends to shareholders. According to the signaling theory (e.g., Vermaelen, 1980), this may be regarded as a signal that the firms perform better in that country. Consequently, the workers in that country may ask for an increase in their wages and other benefits given the observed better performance signalled by higher dividend payments. To achieve a better collective bargaining, the workers tend to join labor unions to have a better bargaining position. This will result in a higher country-level union membership. In this argument, it is the higher dividends that drives the higher union membership.

3.5.2 Instrumental Variables

In the literature of labor economics, both the gender of the workers (e.g., Hirsch, 1980; Hirsch, 1982) and the age of the workers (e.g., Scoville, 1971) have been found as the determinants of the union membership. We follow the literature (e.g., Chen, Kacperczyk and Ortiz-Molina, 2011) and use these two variables as the instrumental variables. We believe that these two variables do not affect a firm's dividend payments directly and conduct the two-stage least squares estimation (2SLS) in our study.

We use two country-level variables as the instrumental variables. We construct a variable to measure the gender of the workers in a country. The variable is called Fraction of Female Workers and it is calculated as the ratio of female workers to total workers in the country that a firm belongs to. We also construct a variable as the measure of the average age of the workers in a country. The variable is called Average Age of the Workers and it is defined as the mean of the age of all the workers in that country. We obtain the data of workers' gender and age from the ILOStat database maintained by International Labor Organization. To our knowledge,

no previous paper has directly connected gender or age to a firm's dividend payments from a theoretical point of view.

To investigate the relevance and the strength of the instrumental variables, we examine the first-stage F-test (Stock, Wright and Yogo 2002) and the partial R2 variables (e.g., Shea, 1997) in our first-stage estimation. Then, in the second stage, we examine whether the instruments are exogenous by using the over-identifying restrictions test. We also use the Hausman (1978) test to examine whether the coefficients of 2SLS estimation are significantly different from the OLS estimation.

3.6 Results - Large sample

We conduct the large sample analysis and report the empirical results in this section. First, we report univariate statistics and the results of OLS regressions on the determinants of dividends. Then, we show the results of the two-stage least squares (2SLS) estimation. We also report the results of sub-samples separated by Employment Protection Legislation and labor bargaining centralization. Furthermore, we conduct further analysis about how the labor unions affect the relation between the dividends and firms' profitability, as well as labor costs. Finally, we report the results of robustness checks.

3.6.1 Univariate statistics

Table 3-1 shows the univariate statistics. We report the univariate statistics of the variables in Panel A. The mean and the median of the variable Dividends is 0.0104 and 0.0000. The mean of the variable Union Membership is 0.2548 and the median is 0.1860. We describe the country-level Dividends and Union Membership in Panel B. The statistics in Panel B further justify our motivation to conduct the analysis in the international setting. We find that the Union Membership in US is 0.1289, while it is significantly lower than the average Union Membership of 66 countries as reported in the Panel A.

Figure 3-1 illustrates the average dividend payments between 1992 and 2013 in 66 countries. The deeper the colour in a country in the world map indicates that dividends are higher in that country. This pattern is consistent with the findings in Visser (2006). The significant difference in the magnitude of dividends between US and the average level of Union Membership around the world motivates us to conduct the analysis with international data.

3.6.2 The determinants of dividends and the likelihood of dividend payouts

Table 3-2 reports the regressions of determinants of dividends and the likelihood of dividend payouts. Column 1 uses OLS regressions to examine the relation between country-level union membership and dividends. We follow the literature and add firm-specific characteristics as control variables in the regressions. We also add year dummy variables, industry dummy variables and country dummy variables in the regression. The coefficient of Union Membership is 0.002 (p-value = 0.01) with the dependent variable is Dividends. Column 2 uses tobit model to examine the likelihood of dividend payouts. The variable Dividend Likelihood is positive and continuous for firms pay out dividends and is equal to 0 for firms doesn't pay out dividends. The coefficient of Union Membership is 0.052 (p-value = 0.01) with the dependent variable is Dividend Likelihood. Column 3 reports the results of OLS regressions with the data of non-US firms. The coefficient of Union Membership is 0.003 (p-value = 0.01) with the dependent variable is Dividends.

The results are consistent with the interpretation that there are more dividends from firms in a country with higher union membership. This is consistent with our Hypothesis 1A that predicts a negative relation between the strength of labor unions and the level of dividends. The findings support the bargaining role of dividends in the international setting.

3.6.3 Country-level regression

To better investigate how the country-level Union Membership affect firms' dividend payments in that country, we conduct the country-level analysis by using equally weighted

financial data in each country. Because the different number of firms in countries takes different weight in the firm-level regression. Instead of using firm-level variables in Table 3-2, we convert all firm-level variables into country-level variables by taking the average of the variables across the countries in a year. We have 974 country-year observations in our country-level analysis.

Table 3-3 reports the results. In Column1, the coefficient of Union Membership is 0.009 (p-value = 0.01) where the dependent variable is Country-level Dividends. In Column 2, the coefficient of Union Membership is 0.010 (p-value = 0.03) for Non-US firms.

Consistent with the firm-level results in Table 3-2, our results imply that the country-level dividends are lower when there is a higher country-level Union Membership. Our results support the Hypothesis 1A.

3.6.4 First-stage regression

Table 3-4 reports the first-stage regression of the 2SLS estimation. We include the two instrumental variables, year dummy variables, industry dummy variables, country dummy and other control variables in the independent variables. The coefficient of the instrumental variable Fraction of Female Workers is 1.537 (p-value = 0.01) and the coefficient of Average Age of the Workers is -0.006 (p-value = 0.01). The p-value of partial F-statistic is 0.01, indicating that the instruments are not weak. The partial R-square is 0.37, indicating that the instruments have a reasonable strength.

3.6.5 Union membership and dividends

We report the second stage of 2SLS estimation in Table 3-5. The dependent variable is Dividends, while the independent variable is the predicted union membership and the same control variables in the first stage of 2SLS. The coefficient of Union Membership in this column is 0.077 (p-value = 0.01). We conduct the over-identifying restrictions test and find that the p-value of F-statistic is 0.23. The insignificant F-statistic implies that the instrument variables are

exogenous and valid. We also conduct the Hausman test and find the p-value of the F-statistic is significant (p-value = 0.01). This means our 2SLS estimate is significantly different from the OLS estimate in Table 3-2. Therefore, it is proper to use the 2SLS estimates instead of OLS estimates to mitigate the endogeneity problems in our research. Column 3 reports the results of non-US firms, the coefficient of Union Membership is 0.079 (p-value = 0.01).

Our results are also more economically significant than the OLS results, because the economic magnitude of the 2SLS estimates describes how the variation of union membership affect the value of dividends. We find that the standard deviation of Union Membership is 0.2503 and the median of non-cash assets is 159.65 million dollars from Table 3-1, we find a one standard deviation increase in Union Membership results to a 0.019 increase (=0.077 * 0.2503) in the level of dividends payments, corresponding to an increase in dividends payments with a dollar value of 3.033 million dollars (=0.019 * 159.65).

The results in Table 3-5 are consistent with Hypothesis 1A that there is a positive relation between labor unions and dividends.

3.6.6 Employment protection legislation

Concerned about the different labor laws in different countries, we include the Employment Protection Legislation in our research to consider the effects of the protection of labor's rights and benefits. Similar with Chapter 2, we get the data of Employment Protection Legislation (EPL) indicator from OECD for its 35 member countries. The higher EPL means the general employment protection in firms in this country is better.

Since the better employment protection indicates more costly of labor adjustments, a higher EPL means higher operating leverage for firms in this country. On one hand, the bargaining hypothesis predicts that firms pay a higher level of dividends to get a better bargaining position when there are stronger labor unions. On the other hand, while higher EPL is associated with higher operating leverage, firms reduce dividend payments to better

withstand higher operating risks. Therefore, the positive effects of labor unions on dividends can be offset in some degree by the negative effects associated with higher operating leverage. As we discussed in Hypothesis 2, we expect the positive relation between union membership and dividends is stronger (weaker) for firms in a country with lower (higher) EPL.

We divide the sample into two sub-groups with a firm in a country with higher (lower) level of employment protection if the EPL indicator of that country is above (below) the median. Table 3-6 shows the results of OLS regressions and the second stage of 2SLS estimations of dividend payments for these two sub-groups in Panel A and Panel B separately.

In Table 3-6 Panel A, we report the OLS regressions of dividends in Column 1 and 2. The coefficient of Union Membership in Column 1 is 0.102 (p-value = 0.01) for the sub-group of firms in a country with lower level of employment protection. The coefficient of Union membership in Column 2 is 0.008 (p-value = 0.01) for the sub-group of firms in a country with higher level of employment protection. We conduct a t-test of the difference in the coefficients of Union Membership between the two sub-groups separated by the EPL indicator, and report the results in Panel B. We find that the coefficients of these two sub-groups are significantly different with the difference is 0.094 (p-value = 0.01). We report the results of second stage of 2SLS estimations in Column 3 and 4. The coefficient of Union Membership in Column 3 is 0.225 (p-value = 0.01) for the sub-group of firms in a country with lower level of employment protection. The coefficient of Union Membership in Column 4 is 0.007 (p-value = 0.01) for sub-group of firms in a country with higher employment protection. The over-identifying restrictions and the Hauseman test show that the results of the 2SLS estimates are more proper to draw implications. Our results in Column 3 and 4 show that the interpretation of bargaining effect of the positive relation is weaker for the sub-group with higher EPL due to the offset effects of operating leverage. We also conduct the t-test of the difference in the coefficients of

Union Membership between the two sub-groups separated by the EPL indicator. The difference is 0.218 (p-value = 0.01).

Therefore, the results in Table 3-6 imply that the positive relation between dividends and union membership is stronger (weaker) when a firm is in a country with a lower (higher) level of employment protection. This is consistent with both Hypothesis 1A and Hypothesis 2.

3.6.7 Labor bargaining centralization

Previous paper also uses the degree of labor bargaining centralization to measure the power of collective bargaining (Simintzi, Vig, and Volpin, 2015). We obtain the data of labor bargaining centralization from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database. We use the country-level variable Centralization in our research, which is a continuous variable ranging from 0 to 1.

A higher level of Centralization indicates higher power of collective bargaining in a country, because a collective bargaining will have a broader impact and will be more centrally coordinated in a country. Therefore, we expect that the positive relation between dividends and union membership is stronger (weaker) when a firm is in a country with a higher (lower) level of Centralization.

In Table 3-7 Panel A, we report the OLS regressions of dividends in Column 1 and 2. The coefficient of Union Membership in Column 1 is 0.064 (p-value = 0.01) for the sub-group of firms in a country with lower level of labor bargaining centralization. The coefficient of Union membership in Column 2 is 0.242 (p-value = 0.01) for the sub-group of firms in a country with higher level of labor bargaining centralization. We conduct a t-test of the difference in the coefficients of Union Membership between the two sub-groups separated by the EPL indicator, and report the results in Panel B. We find that the coefficients of these two sub-groups are significantly different with the difference is -0.178 (p-value = 0.01). We report the results of second stage of 2SLS estimations in Column 3 and 4. The coefficient of Union Membership in

Column 3 is 0.199 (p-value = 0.01) for the sub-group of firms in a country with lower level of labor bargaining centralization. The coefficient of Union Membership in Column 4 is 0.472 (p-value = 0.01) for sub-group of firms in a country with higher labor bargaining centralization. The over-identifying restrictions and the Hauseman test show that the results of the 2SLS estimates are more proper to draw implications. Our results in Column 3 and 4 show that the interpretation of bargaining effect of the positive relation is stronger for the sub-group with higher labor bargaining centralization due to the higher bargaining power of labor unions. We also conduct the t-test of the difference in the coefficients of Union Membership between the two sub-groups separated by the labor bargaining centralization. The difference is -0.273 (p-value = 0.01).

Therefore, the results in Table 3-7 imply that the positive relation between dividends and union membership is stronger (weaker) when a firm is in a country with a higher (lower) level of Centralization. This is consistent with Hypothesis 1A.

3.7 Results – Smaller sample

To further understand the positive relation between union membership and dividends in the large sample study, we conduct the analysis for a smaller sample of dividend change. We use the methodology of event study to examine this smaller sample. While the large sample analysis examines the level of dividends, the smaller sample analysis allows us to examine firm performance associated with the dividends. Moreover, an additional benefit of conducting such analysis is to reduce the endogeneity problem by studying how union membership affects the relation between the change in dividends and the change in firm performance.

We construct a sample of dividend increases and dividend decreases with international data. We obtain the data of ordinary cash dividend payments from CRSP database for US firms and from Compustat Global database for firms in other countries. We compare two adjacent dividend payments, and define a dividend increase (decrease) event when the latter dividend

payment is higher (lower) than the former dividend payment. [32] We get a sample of 56466 dividend increase events and 31816 dividends decrease events in 55 countries. [33]

3.7.1 Variables

We describe the variables in smaller sample analysis in this section.

3.7.1.1 Announcement return

We follow the literature (e.g. Brown and Warner, 1985) and calculate the announcement return of dividend increase (decrease) event by using the cumulative abnormal return over days (-3, +3) around the announcement date. The cumulative abnormal return is calculated based on the following market model.

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (3)$$

where $R_{i,t}$ is the stock return of stock i; $R_{m,t}$ is the return of a stock market index in the country where stock i belongs to.

We get the data of stock market indices of different countries from Datastream database.[34] To estimate the market model, we use a firm's daily return and the return on its corresponding stock market index over days -200 to -20, where day 0 is the event date.

3.7.1.2 Change in operating performance

We use the net change in ROA as a measure of the change in firm performance around the dividend increases (decreases). ROA is defined as the ratio of EBIT to assets. We calculate the change in ROA from year t-1 to year t+1. We define Net Change in ROA as the difference between an event firm's change in ROA and its matched comparable firm's change in ROA from year t-1 to year t+1.

---

[32] A firm may pay dividends in different frequency, such as quarterly, semi-annually or annually. We compare two adjacent dividend payments based on a firm's own dividend payment frequency.
[33] Appendix 3-2 reports the univariate statistics of smaller sample.
[34] For example, we use FTSE 100 index as the market index for UK stocks, and we use TOPIX Index as the market index for Japanese stocks. See Appendix 3-1 for detailed description of the stock market indices that we use for each country.

We use two methods to find out the comparable firms. First, we choose the comparable firms based on the matching by industry, size and M/B. We rank all non-event firms in the same industry as an event firm based on the difference in size and M/B, and choose a non-event firm as a comparable firm if the sum of the percentage difference in size and the percentage difference in M/B between the non-event firm and the event firm is smallest in the industry. Second, we choose the comparable firms based on the method of propensity score matching. We first run a probit model based on size, M/B, cash flow, R&D, etc[35]. We calculate the propensity score of each non-event firm. Then we match each event firm to a non-event firm in the same country requiring that the non-event firm has minimum difference in propensity score.

3.7.2 Results about dividend changes events

We report the results of smaller sample analysis. First, we report the regressions about the announcement return around dividend changes. Next, we conduct the analysis on the change in operating performance around the events.

3.7.2.1 Announcement return

Table 3-8 and Table 3-9 show the results of the market reaction around dividend increases and decreases. The dependent variables are the announcement returns in these tables.

Table 3-8 reports the results about the event of dividend increases. Column 1 shows that the coefficient of Union Membership is 0.008 (p-value = 0.04) when the dependent variable is the cumulative abnormal returns over days (-1, +1) around the announcement date of dividend increases. It shows that there is positive relation between announcement return and Union Membership, indicating that shareholders have more positive reaction when dividends are increased by a firm in a country with higher Union Membership. It implies that when a firm

[35] We report the probit model in Appendix 3-3

increases dividend payment, it reduces the resources available for potential collective bargaining. This is beneficial for shareholders and it is associated with positive market reaction. This is more prominent for the firms in a country with higher union membership. We find similar results when the dependent variables are the cumulative abnormal returns over days (-3, +3) around the announcement date in Column 2 and the cumulative abnormal returns over days (-5, +5) around the announcement date in Column 3. The coefficient of Union Membership is 0.011 (p-value = 0.05) in Column 2 and 0.010 (p-value = 0.06) in Column 3.

Table 3-9 shows the results about the dividend decreases. We have consistent results when the dependent variable is the cumulative abnormal returns over days (-1, +1) in Column 1, (-3, +3) in Column 2 and (-5, +5) in Column 3 around the announcement. The coefficient of Union Membership is -0.008 (p-value = 0.03) in Column 1, -0.011 (p-value = 0.02) in Column 2 and -0.015 (p-value = 0.07) in Column 3. It shows that there is negative relation between the announcement return around the event of dividend decreases and implying that shareholders have more negative reaction when the dividend decrease is made by a firm in a country with higher union membership.

Our results in Table 3-8 and Table 3-9 indicate that the announcement return is higher (lower) when a dividend increase (decrease) is made by a firm in a country with higher union membership. It implies that when a firm increases dividends, it reduces the resources available for potential collective bargaining. Labor unions accept a lower level of wage in that there may be liquidity shortage, provided that bankruptcy is costly for employees, that leads to lower operating costs. This is beneficial for shareholders and it is associated with positive market reaction with dividend increases. This is more prominent for the firms in a country with higher union membership. When a firm decreases dividends, labor unions tend to organize collective bargaining because they can get more wages and other benefits from the saving of cash flow from dividend decreases. The higher labor costs increase the operating costs leads to more

negative reaction of shareholders to dividend decrease in a country with higher union membership. This is consistent with the bargaining hypothesis.

3.7.2.2 Change in operating performance

Table 3-10 and Table 3-11 show the results of the change in operating performance around the events of dividend increases and dividend decreases.

Table 3-10 reports the results about dividend increases. The dependent variable in Column 1 is the Change in ROA from year t-1 to year t+1. The coefficient of Union Membership is 0.029 (p-value = 0.01). It implies that there is a positive relation between Union Membership and the change in operating performance around the event of dividend increases. The dependent variables in Columns 2 and Column 3 are the Net Change in ROA, which is defined as the difference between an event firm's change in ROA and its comparable firm's change in ROA from year t-1 to year t+1. The coefficient of Union Membership in Column 2 is 0.018 (p-value = 0.03), indicating that firms in countries with higher union membership have a higher net change in operating performance around the event of dividend increases. It implies a similar rationale that a dividend increase reduces the resources available for potential collective bargaining, and it is more beneficial for the operating performance of the firms in a country with higher union membership. We have similar results in Column 3, the coefficient of Union Membership is 0.017 (p-value = 0.01) when we use the propensity score matching method.

Table 3-11 shows the results about dividend decreases. We have consistent results when the dependent variable is Change in ROA form year t-1 to year t+1 in column 1 and the dependent variable is Net Change in ROA form year t-1 to year t+1 based on the Size & M/B matching method in the same industry in Column 2 and based on the propensity score matching method in Column 3 separately. The coefficient of Union Membership is -0.008 (p-value = 0.06) in Column 1, is -0.016 (p-value = 0.04) in Column 2, and is -0.009 (p-value = 0.02) in

Column 3. It implies that there is negative relation between Union Membership and the change in operating performance around the event of dividend decreases.

Firms in countries with higher union membership have a higher net change in operating performance around the event of dividend increases. Because dividend increase reduces the resources available for potential collective bargaining. Labor unions accept a lower level of wage in that there may be liquidity shortage, provided that bankruptcy is costly for employees, that leads to lower operating costs. It is more beneficial for the operating performance of the firms in a country with higher union membership. When a firm decreases dividends, labor unions tend to organize collective bargaining because they can get more wages and other benefits from the saving of cash flow from dividend decreases. The higher labor costs increases operating costs that leads to more negative reaction of shareholders to dividend decrease in country with higher union membership. Our results in Table 3-10 and Table 3-11 are consistent with the interpretation that there is a positive (negative) relationship between Union Membership and the change in operating performance around the events of dividend increases (decreases). This is consistent with our bargaining hypothesis.

3.8 Further analysis

We conduct further analysis in this section to study the relation between labor unions and dividends.

3.8.1 Dividends and labor costs

We investigate how labor unions affect the relation between dividends and labor costs in this section. Yu (2010) state that dividends are negatively associated with labor wages, because dividend payments reduce the cash reserves available for collective bargaining. Accordingly, firms tend to pay out more dividends to lower wage claims when the country-level labor unions are stronger in that labor unions strengthen the bargaining power of employees. Consequently, dividend payments decrease labor costs. Therefore, we expect that the negative effects of

dividends to labor costs are stronger for firms in a country with higher union membership, and are weaker for firms in a country with lower union membership.

Similar with Chapter 2, we follow Chemmanur, Cheng and Zhang (2013) and use the logarithm of the ratio of staff expenses to the number of employees as the measurement of labor costs. We construct a sub-sample of 77380 firm-year observations. We divide the sample into two sub-groups separated by country-level union membership. A firm is in a country with higher (lower) union membership if its country-level union membership is above (below) the median.

Table 3-12 shows the results. In Panel A, we report the OLS regressions in Column 1 and 2. The coefficient of Dividends in Column 1 is -0.267 (p-value = 0.07) for the sub-group of firms with lower country-level union membership. The coefficient of Dividends in Column 2 is -0.350 (p-value = 0.01) for the sub-group of firms with higher country-level union membership. The negative coefficients imply that there is a negative relation between dividends and labor costs. We conduct a t-test of the difference in the coefficients of Dividends between the two sub-groups separated by union membership, and report the results in Panel B. We find that the difference is 0.170 (p-value = 0.01). The significant difference implies that the coefficient of Dividends for the sub-group of firms with lower country-level union membership is significantly higher than the coefficient of Dividends for the sub-group of firms with higher country-level union membership.

Therefore, the results in Table 3-12 imply that the negative relation between dividends and labor costs is stronger (weaker) for firms in a country with higher (lower) union membership. The higher country-level union membership, firms' bargaining power against labor unions weakens. In this situation, firms pay more dividends to reduce the internal resources available for collective bargaining and they can claim that they have insufficient liquidity. Labor unions will lower their wage demands because the bankruptcy is also costly to

employees. Consequently, firms gain bargaining benefits with higher dividends in collective bargaining against labor unions and reduce the labor costs. The negative effects of dividend payments on labor costs are stronger in a country with higher union membership. The results support the bargaining hypothesis and are consistent with the Hypothesis 1A.

3.8.2 Dividends and strikes & lockouts

As discussed in 2.6.12, strikes are used as bargaining tool by labor unions in wage negotiations. Labor unions can get less benefits when firms decrease their internal funds by increasing dividend payments. To study whether dividend policy influences the country-level strikes and lockouts, we conduct further analysis by using the proxy of the intensity of strikes and lockouts in a country. The higher dividend payments in firms, there may be less strikes organized by labor unions, because labor unions have less incentive to use strikes to strengthen their bargaining power in wage negotiations due to the lower available financial resources in firms. We expect that the relation between dividends and the country-level strikes & lockouts is negative. Labor unions are less likely to organize strikes in a country when firms have more dividend payments and less internal resources.

Similar with Chapter 2, we get the data of strikes & lockouts from the International Labor Organization and construct a variable called Log (Country-level Strikes & Lockouts + 1). We obtain the data on labor force from International Labor Organization as an additional control variable. We conduct the country-level analysis in a similar way as Table 3-3. We convert all firm-level variables into country-level variables by taking the average of the variables across the countries.

We report the results in Table 3-13. The dependent variable is the Log (Country-level Strikes & Lockouts + 1). The coefficient of the variable Country-level Dividends is -9.218 (p-value = 0.08). The negative coefficient indicates that there is a negative relation between strikes & lockouts and dividends in a country. When firms payout more dividends, they have less

internal financial resources that can be extracted by labor unions. Labor unions have fewer incentives to organize strikes to gain bargaining power in wage negotiations. Therefore, the results in Table 3-12 support the bargaining hypothesis in that fewer strikes are organized by labor unions as bargaining tool in wage negotiations when firms have more dividend payments.

3.8.3 The validity of instrumental variables

As discussed in Chapter 2, we collect the data of gender gap from World Economic Forum to test the validity of instrumental variables. It has been found that the average salary of female workers is lower compared with male workers. On one hand, the average lower level of salary for female workers in a country implies that firms' wage payments are lower in a country with more female workers. Firms have more cash reserves and have the incentive to increase dividends due to the free cash flow problem. On the other hand, the coefficient of Fraction of Female Workers in Table 3-4 is positive, which means more female workers are associated with higher union membership. This leads to a positive relation between dividends and union membership in that the gender pay gap.

Similar with 2.7.1, we construct the variable of Gender Gap and divide our sample into two sub-groups based on the median. A firm is in a country with lower (higher) gender gap if the index is above (below) the median. The higher index means that female and male are more equal in a country.

Table 3-13 shows the results. We show the second stage of two 2SLS estimation for brevity. Column 1 shows that the coefficient of Union Membership is 0.023 (p-value = 0.01), and Column 2 shows that such coefficient is 0.111 (p-value = 0.01). We conduct t-test and find that the difference is -0.088 (p-value = 0.94). The results imply that after we control for the gender gap, we still find that firms in countries with higher union membership have more dividends in both sub-groups. Therefore, the findings support the interpretation that the results

are not entirely driven by the gender pay gap and that they are consistent with our bargaining hypothesis.

3.8.4 Collective bargaining coverage

We also conduct the robustness check by using the collective bargaining coverage rate as alternative measure for the bargaining power of labor unions. Similar with Chapter 2, the collective bargaining coverage rate include the workers who are not union members but are covered by labor unions and we collect the data from the ICTWSS database. The data of collective bargaining coverage rate are recorded in intervals. We use the data available in the closest precedent year as a proxy for the Collective Bargaining Coverage Rate when the data is missing in a year. We construct the variable Collective Bargaining Coverage Rate defined as the percentage of workers who are covered by the collective bargaining agreements for all workers.

We show the results about Collective Bargaining Coverage Rate in Table 3-15. We use the similar specifications as in previous tables. In Panel A, Column 1 shows the results of OLS regression and Column 2 shows the results of the second stage of 2SLS estimates when the dependent variable is Dividends. The coefficient of Collective Bargaining Coverage Rate is 0.009 (p-value = 0.01) in Column 1 and is 0.016 (p-value = 0.01) in Column 2 when the dependent variable is Dividends. The results are similar with the previous tables that there is a positive relation between Collective Bargaining Coverage Rate and dividends. We conduct the test on the relation between announcement return around the events of dividends changes and the Collective Bargaining Coverage Rate. In Panel B, we report the announcement return over days around the date of the event of dividends changes. The coefficient of Collective Bargaining Coverage Rate is 0.010 (p-value = 0.01) in Column 1, is 0.011 (p-value = 0.01) in Column 2 and is 0.012 (p-value = 0.01) in Column 3 with the dependent variable is the cumulative abnormal returns over days (-1, +1), (-3, +3) and (-5, +5) around the announcement

date of dividend increases. The coefficient of Collective Bargaining Coverage Rate is -0.024 (p-value = 0.02) in Column 4, is -0.046 (p-value = 0.04) in Column 5 and is -0.055 (p-value = 0.01) in Column 6 with the dependent variable is the cumulative abnormal returns over days (-1, +1), (-3, +3) and (-5, +5) around the announcement date of dividend decreases.

Our results are consistent with the previous tables in that the positive relation between the announcement return around the event of dividend increases, and that the negative relation between the announcement return around the event of dividend decreases. Therefore, we find similar results when we use collective bargaining coverage rate as alternative proxy for bargaining power of labor unions.

3.9 Conclusion

This chapter finds significant relations between labor unions and dividends in the international setting. We test the two opposite effects of labor unions on a firm's dividend payments from both bargaining perspective and operating leverage perspective. We find significant effects of the bargaining power from labor unions, that firms in countries with higher union membership pay more dividends.

We use the country-level union membership as the measure of the bargaining power of labor unions across countries in our large sample analysis. We use two-stage least square estimation accompanied with the econometrics tests for the validity of the instruments and the specification. However, we find evidence of the presence of opposite effects of operating leverage from labor unions on dividends. We divide our sample into two sub-groups with employment protection legislation higher or lower the median. We find the positive relationship is weaker for firms in countries with higher employment protection legislation.

Moreover, we construct a smaller sample to do the event study about how the country-level union membership affect the around the date of dividend increase and dividend decrease. In the announcement return of dividends changes analysis, we find out that union memberships

positively affect the announcement return of the events of dividend increases, and negatively affect the announcement return of the events of dividend decreases. In terms of the operating performance around the events, we find positive relation between union membership and net ROA change around the event date of dividend increases, and negative relation between union membership and net ROA change around the event date of dividend decreases.

In addition, we find the positive relation between dividends and labor costs is weaker for firms in countries with lower union membership. Furthermore, we find that the number of strikes & lockouts is lower in countries with more dividend payments. Also, we collective bargaining coverage rate to construct the robustness check and find consistent results.

Our findings are consistent with the bargaining hypothesis, and we conclude that firms strategically choose dividend payments to gain the bargaining position with labor in the international setting.

Appendix 3-1 Market Equity Indices

This table shows the market equity indices used in the market model shown in Equation (3) in Section 3.7.1 and 4.7.1 to calculate the cumulative abnormal return (see the text for details).

Country	Datastream Code	Equity Index
Argentina	ARGMERV	ARGENTINA MERVAL
Australia	ASX200I	Standard and Poor's / Australian Stock Exchange 200
Austria	ATXINDX	ATX - Austrian Traded Index
Belgium	BGBEL20	Belgium 20
Bulgaria	BSSOFIX	Bulgaria Stock Exchange Sofix
Canada	TTOCOMP	Standard and Poor's / Toronto Stock Exchange Composite Index
China	CHSASHR	Shanghai Stock Exchange A Share
Colombia	COLIGBC	Colombia Igbc Index
Czech Republic	CZPXIDX	Prague Stock Exchange PX
Croatia	CTCROBE	Croatia Crobex
Cyprus	CYPMAPM	Cyprus General
Denmark	DKKFXIN	OMX Copenhagen (OMXC20)
Egypt	EGHFINC	Egypt Hermes Financial
Estonia	ESTALSE	OMX Tallinn (Omxt)
Finland	HEXINDX	OMX Helsinki (OMXH)
France	FRCAC40	France CAC 40
Germany	DAXINDX	DAX 30 Performance
Greece	GRAGENL	Athex Composite
Hong Kong	HNGKNGI	Hang Seng
Hungary	BUXINDX	Budapest (BUX)
Iceland	ICEXALL	OMX Iceland All Share
India	ICRI500	Nifty 500
Indonesia	JAKCOMP	Jakarta Index Composite
Ireland	ISEQUIT	Ireland Stock Exchange Overall (Iseq)
Israel	ISTA100	Israel Ta 125
Italy	FTSEMIB	FTSE MIB Index
Japan	TOKYOSE	TOPIX
Kuwait	KWKICGN	Kuwait KIC General
Luxembourg	LUXGENI	Luxembourg Stock Exchange General
Malaysia	FBMKLCI	FTSE Bursa Malaysia KLCI
Mexico	MXIPC35	Mexico IPC (Bolsa)
Morocco	MASIIDX	Morocco All Share (Masi)
Netherlands	AMSTEOE	Euronext Amsterdam AEX Index (AEX)
New Zealand	NZ50CAP	Standard and Poor's / NZX 50
Pakistan	PKSE100	Karachi Stock Exchange 100
Peru	PEGENRL	Standard and Poor's / BVL General (Igbvl)
Philippines	PSECOMP	Philippines Stock Exchange I (Psei)
Portugal	POPSI20	Portugal PSI-20
Russia	RSRTSIN	Russia RTS Index
Singapore	SNGPORI	Straits Times Index Local Currency

Appendix 1 (Continued)

Country	Datastream Code	Equity Index
Slovenia	SLOETOP	Slovenian Blue Chip (SBI Top)
Slovakia	SXSAX16	Slovakia SAX 16
South Africa	JSEOVER	FTSE / JSE All Share
South Korea	KORCOMP	Korea Stock Exchange Composite (KOSPI)
Spain	IBEX35I	IBEX 35
Sri Lanka	SRALLSH	Colombo Stock Exchange All Share
Sweden	SWEDOMX	OMX Stockholm 30 (OMXS30)
Switzerland	SWISSMI	Swiss Market (SMI)
Thailand	BNGKSET	Bangkok S.E.T.
Turkey	TRKISTB	Bist National 100
United Kingdom	FTSE100	FTSE 100

Appendix 3-2 Univariate Statistics – Smaller Sample

This table shows univariate statistics of smaller sample. We use a sample of 56466 events of dividends increase from 55 countries and a sample of 31816 events of dividends decrease from 55 countries between 1992 and 2013. Panel A reports univariate statistics for the sample of the events of dividend increases. Panel B reports univariate statistics for the sample of the events of dividend decreases. CAR (-1, +1) is the cumulative abnormal return over days (-1, +1) around the announcement days. CAR (-3, +3) is the cumulative abnormal return over days (-3, +3) around the announcement days. CAR (-5, +5) is the cumulative abnormal return over days (-5, +5) around the announcement days. The cumulative abnormal return is calculated based on the market model. We use a firm's daily return and the return on its corresponding stock market index over days -200 to -20, where day 0 is the event date. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Cash* is defined as the ratio of cash and marketable securities to assets.

Panel A: Univariate Statistics for the Events of Dividend Increases

Variable	Mean	Median	25th Percentile	75th Percentile	Standard Deviation
CAR (-1, +1)	0.009	0.005	-0.016	0.031	0.050
CAR (-3, +3)	0.012	0.007	-0.024	0.044	0.068
CAR (-5, +5)	0.013	0.008	-0.031	0.053	0.080
Union Membership	0.218	0.143	0.114	0.245	0.183
Size	20.279	20.172	18.823	21.635	1.939
Tobin's Q	1.687	1.375	1.081	1.913	1.075
Leverage	0.152	0.120	0.019	0.242	0.146
Capital Expenditures	0.058	0.042	0.024	0.074	0.053
Cash Flow	0.066	0.057	0.033	0.092	0.058
R&D	0.010	0.000	0.000	0.004	0.028
Working Capital	0.183	0.162	0.033	0.306	0.196
Industry Cash Flow Volatility	0.056	0.050	0.038	0.074	0.025
Cash	0.195	0.092	0.031	0.213	0.419

Panel B: Univariate Statistics for the Events of Dividend Decreases

Variable	Mean	Median	25th Percentile	75th Percentile	Standard Deviation
CAR (-1, +1)	0.001	0.000	-0.022	0.022	0.051
CAR (-3, +3)	0.002	0.000	-0.033	0.034	0.069
CAR (-5, +5)	0.003	0.000	-0.040	0.042	0.081
Union Membership	0.240	0.191	0.151	0.247	0.165
Size	20.019	19.855	18.776	21.131	1.740
Tobin's Q	1.402	1.119	0.907	1.487	1.037
Leverage	0.123	0.090	0.012	0.193	0.127
Capital Expenditures	0.050	0.037	0.021	0.062	0.048
Cash Flow	0.041	0.032	0.013	0.063	0.061
R&D	0.010	0.000	0.000	0.008	0.026
Working Capital	0.191	0.177	0.051	0.318	0.198
Industry Cash Flow Volatility	0.055	0.050	0.037	0.070	0.023
Cash	0.230	0.131	0.058	0.261	0.440

Appendix 3-3 Propensity Score Matching – The Events of Dividend Increase/ Decrease

This table shows the logistic regression about the likelihood that a firm increases (decreases) the payment of dividends. We use a sample of 36149 (18494) events of dividend increase (decrease) from 46 countries between 1992 and 2013. Column 1 shows the logistic regression for the events of dividends increase. The dependent variable is 1 if an event of dividend increase takes place and is 0 otherwise. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Working Capital* is defined as the ratio of current assets minus current to assets *Sales Growth* is defined as the percentage change of sale over the previous year. *Retained Earnings* is defined as the ratio of retained earnings over total assets. Column 2 shows the logistic regression for the events of dividends decrease. The dependent variable is 1 if an event of dividend decrease takes place and is 0 otherwise. The p–value is noted in the parentheses.

	Dividend Increase=1	Dividend Decrease=1
Intercept	-8.472	-6.344
	(0.01)	(0.01)
Size	0.296	0.183
	(0.01)	(0.01)
Tobin's Q	-0.022	-0.094
	(0.01)	(0.01)
Cash Flow	6.929	3.431
	(0.01)	(0.01)
R&D	-2.884	-3.963
	(0.01)	(0.01)
Capital Expenditure	-0.566	1.285
	(0.01)	(0.01)
Industry Cash Flow Volatility	0.873	-2.137
	(0.01)	(0.01)
Leverage	0.425	-0.577
	(0.01)	(0.01)
Working Capital	0.062	0.189
	(0.07)	(0.01)
Sales Growth	-0.129	-0.231
	(0.01)	(0.01)
Retained Earnings	0.668	0.220
	(0.01)	(0.01)
Number of Observations	355715	355715
Pseudo R-square	0.14	0.05

Table 3-1 Univariate Statistics

This table shows univariate statistics. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. Panel A reports univariate statistics. *Dividend*s is defined as the ratio of dividends to assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Fraction of Female Workers* is defined as the fraction of female workers in the country a firm belongs to. *Average Age of the Workers* is the average age of the workers in the country a firm belongs to. *Employment Protection Legislation* is the OECD indicators of employment protection legislation that measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts in a country. *Centralization* is an indicator of the degree of labor bargaining centralization in a country from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database. Panel B reports dividends and union membership by countries. The mean of dividends, total payout and union membership in a country are reported in the panel.

Panel A. Univariate Statistics

Variable	Mean	Median	25th Percentile	75th Percentile	Standard Deviation
Dividends	0.010	0.000	0.000	0.011	0.022
Union Membership	0.255	0.186	0.129	0.279	0.250
Size	19.239	19.080	17.894	20.409	1.873
Tobin's Q	1.713	1.244	0.958	1.849	1.456
Leverage	0.127	0.071	0.001	0.202	0.152
Capital Expenditures	0.057	0.037	0.017	0.069	0.066
Cash Flow	-0.012	0.027	-0.014	0.065	0.181
R&D	0.025	0.000	0.000	0.012	0.074
Working Capital	0.203	0.179	0.037	0.352	0.246
Industry Cash Flow Volatility	0.061	0.057	0.040	0.077	0.026
Fraction of Female Workers	0.439	0.454	0.419	0.464	0.038
Average Age of the Workers	39.718	39.557	38.335	40.962	2.133
Employment Protection Legislation	1.362	1.369	0.257	2.194	0.970
Centralization	0.258	0.224	0.153	0.309	0.126

Panel B. Dividends and Union Membership by Countries

Country	Dividends	Union Membership	Country	Dividends	Union Membership
Argentina	0.008	0.382	Malaysia	0.013	0.103
Australia	0.018	0.214	Malta	0.026	0.546
Austria	0.011	0.341	Mauritius	0.017	0.257
Belgium	0.009	0.543	Mexico	0.006	0.159
Brazil	0.014	0.253	Namibia	0.074	0.304
Bulgaria	0.002	0.166	Netherlands	0.017	0.217
Canada	0.010	0.288	New Zealand	0.020	0.217
Chile	0.007	0.144	Norway	0.013	0.544
China	0.007	0.459	Peru	0.009	0.042
Colombia	0.009	0.165	Philippines	0.009	0.145
Croatia	0.002	0.328	Poland	0.003	0.152
Cyprus	0.010	0.530	Portugal	0.006	0.215
Czech Republic	0.003	0.241	Russia	0.005	0.317
Denmark	0.015	0.710	Serbia	0.000	0.279
Egypt	0.009	0.275	Singapore	0.013	0.183
Estonia	0.022	0.092	Slovakia	0.003	0.256
Finland	0.027	0.726	Slovenia	0.007	0.319
France	0.005	0.079	South Africa	0.015	0.338
Germany	0.011	0.225	South Korea	0.006	0.104
Greece	0.010	0.243	Spain	0.012	0.167
Hungary	0.015	0.193	Sri Lanka	0.018	0.142
Iceland	0.004	0.835	Sweden	0.022	0.741
India	0.013	0.175	Switzerland	0.014	0.193
Indonesia	0.005	0.152	Tanzania	0.046	0.202
Ireland	0.012	0.369	Thailand	0.010	0.029
Israel	0.010	0.373	Trinidad and Tobago	0.021	0.210
Italy	0.007	0.350	Turkey	0.007	0.072
Japan	0.007	0.201	Ukraine	0.000	0.647
Kazakhstan	0.001	0.423	United Kingdom	0.020	0.294
Kuwait	0.028	0.023	United States	0.010	0.129
Latvia	0.006	0.164	Vietnam	0.003	0.146
Lithuania	0.010	0.108	Zambia	0.035	0.057
Luxembourg	0.009	0.385	Zimbabwe	0.009	0.075

Figure 3-1 Dividends around the world

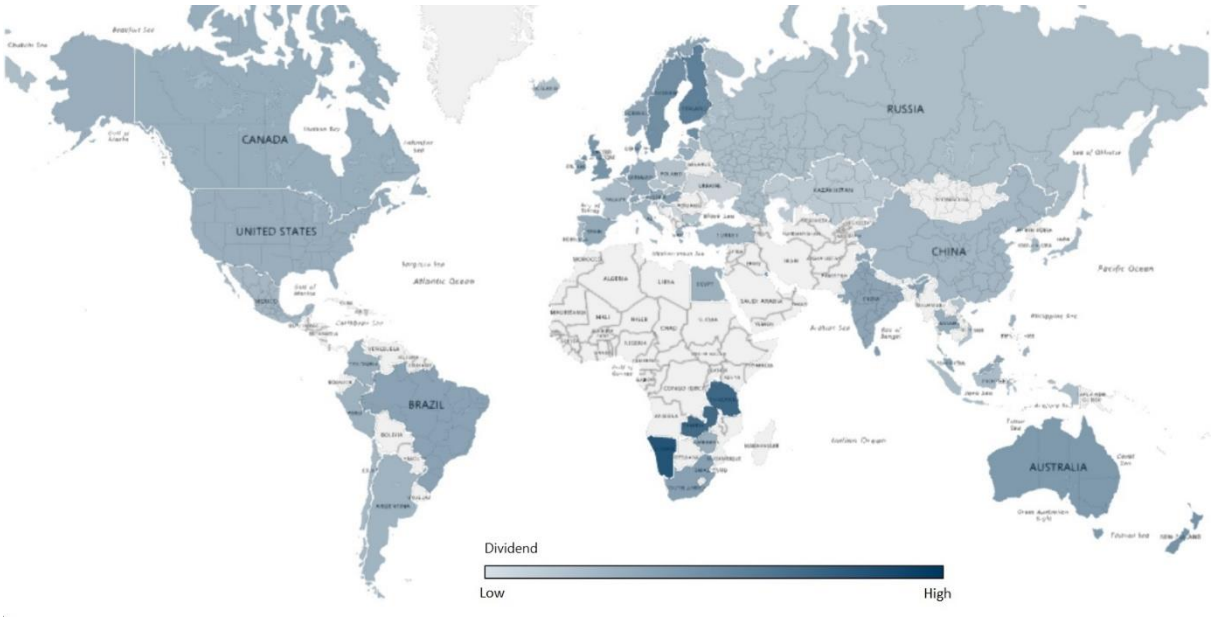

Table 3-2 Union Membership and Dividends

This table shows regressions about union membership, dividends and the likelihood of dividend payouts. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Dividend*s is defined as the ratio of dividends to assets. *Dividend Likelihood* is positive and continuous for firms pay out dividends and is equal to 0 for firms doesn't pay out dividends. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	Dividends	Dividend Likelihood	Dividends
	Full sample	Full sample	Non-US firms
Intercept	-0.013	-0.078	-0.001
	(0.01)	(0.01)	(0.04)
Union Membership	0.002	0.052	0.003
	(0.01)	(0.01)	(0.01)
Size	0.001	0.003	0.000
	(0.01)	(0.01)	(0.01)
Tobin's Q	0.002	0.003	0.002
	(0.01)	(0.01)	(0.01)
Leverage	-0.008	-0.013	-0.007
	(0.01)	(0.01)	(0.01)
Capital Expenditure	-0.001	0.004	0.004
	(0.34)	(0.01)	(0.01)
Cash Flow	0.021	0.069	0.036
	(0.01)	(0.01)	(0.01)
R&D	0.006	0.006	0.012
	(0.01)	(0.01)	(0.01)
Working Capital	0.002	0.005	0.005
	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.046	-0.119	-0.039
	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	355715	355715	262326
Adjusted R-square	0.12	0.11	0.13

Table 3-3 Union Membership and Dividends: Country-level Analysis

This table shows an OLS regression on the country-level analysis about union membership and dividends. We convert all firm-level variables into country-level variables by taking the average of the variables across the countries. The sample includes 974 country-year observations between 1992 and 2013. *Dividend*s is defined as the ratio of dividends to assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p-value is noted in the parentheses.

	Country-level Dividends	
	Full sample	Non-US firms
Intercept	0.012	0.039
	(0.51)	(0.02)
Union Membership	0.009	0.010
	(0.01)	(0.03)
Country-level Size	-0.001	-0.002
	(0.01)	(0.01)
Country-level Tobin's Q	-0.001	-0.001
	(0.11)	(0.03)
Country-level Leverage	-0.031	-0.027
	(0.01)	(0.01)
Country-level Capital Expenditure	-0.020	-0.010
	(0.21)	(0.50)
Country-level Cash Flow	0.064	0.060
	(0.01)	(0.01)
Country-level R&D	0.112	0.120
	(0.01)	(0.01)
Country-level Working Capital	0.000	0.005
	(1.01)	(0.39)
Country-level Cash Flow Volatility	0.073	0.090
	(0.41)	(0.29)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	974	952
Adjusted R-square	0.70	0.70

Table 3-4 Two-stage Least Square Estimation: First Stage

This table shows the first stage of two-stage least square estimation. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Fraction of Female Workers* is defined as the fraction of female workers in the country a firm belongs to. *Average Age of the Workers* is the average age of the workers in the country a firm belongs to. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	Union Membership
Intercept	-0.426
	(0.01)
Fraction of Female Workers	1.537
	(0.01)
Average Age of the Workers	-0.006
	(0.01)
Size	0.000
	(0.01)
Tobin's Q	-0.001
	(0.01)
Leverage	-0.008
	(0.01)
Capital Expenditure	-0.016
	(0.01)
Cash Flow	0.000
	(0.71)
R&D	0.009
	(0.01)
Working Capital	-0.013
	(0.01)
Industry Cash Flow Volatility	-0.183
	(0.01)
Year Dummy Variables	YES
Industry Dummy Variables	YES
Country Dummy Variables	YES
Number of Observations	355715
Adjusted R-square	0.89
Partial F-statistic (p-value)	0.01
Partial R-square	0.37

Table 3-5 Two-stage Least Square Estimation: Second Stage

This table shows the second stage of two-stage least square estimation. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Dividend*s is defined as the ratio of dividends to assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	Dividends	
	Full sample	Non-US firms
Intercept	-0.023	-0.022
	(0.01)	(0.01)
Union Membership	0.077	0.079
	(0.01)	(0.01)
Size	0.001	0.001
	(0.01)	(0.01)
Tobin's Q	0.004	0.002
	(0.01)	(0.01)
Leverage	-0.010	-0.013
	(0.01)	(0.01)
Capital Expenditure	0.000	0.006
	(0.64)	(0.01)
Cash Flow	0.017	0.039
	(0.01)	(0.01)
R&D	-0.027	-0.002
	(0.01)	(0.05)
Working Capital	0.003	0.006
	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.034	-0.041
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	355715	262326
Adjusted R-square	0.12	0.18
Over-identifying Restrictions Test (p-value)	0.23	0.41
Hausman Test (p-value)	0.01	0.01

Table 3-6 Employment Protection Legislation

This table shows OLS regressions and the second-stage regressions of the 2SLS estimation for the sub-groups separated by the employment protection legislation. We use a sample of 281691 firm-year observations from 41 countries between 1992 and 2013. Panel A shows the regressions of *Dividends*. *Dividend*s is defined as the ratio of dividends to assets. *Employment Protection Legislation* is the OECD indicators of employment protection legislation that measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts in a country. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions of Dividends

	Dividends			
	OLS		The Second Stage of 2SLS	
	EPL < Median	EPL ≥ Median	EPL < Median	EPL ≥ Median
Intercept	-0.017	-0.008	-0.080	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	0.102	0.008	0.225	0.007
	(0.01)	(0.01)	(0.01)	(0.01)
Size	0.001	0.001	0.001	0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.002	0.003	0.002	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.005	-0.013	-0.005	-0.008
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	-0.009	-0.001	-0.009	0.001
	(0.01)	(0.40)	(0.01)	(0.49)
Cash Flow	0.011	0.041	0.011	0.040
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	-0.002	0.004	-0.002	0.020
	(0.02)	(0.01)	(0.01)	(0.01)
Working Capital	-0.005	0.004	-0.005	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.038	-0.034	-0.034	-0.038
	(0.01)	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	158647	123044	158647	123044
Adjusted R-square	0.09	0.24	0.10	0.16
Over-identifying Restrictions Test (p-value)			0.48	0.36
Hausman Test (p-value)			0.01	0.01

Panel B. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by EPL and reports the p-value of the t-test in the parentheses.

	Union Membership	
	OLS	Second Stage of 2SLS Estimation
Difference	0.094	0.218
(p-value)	(0.01)	(0.01)

Table 3-7 Labor Bargaining Centralization

This table shows OLS regressions and the second-stage regressions of the 2SLS estimation for the sub-groups separated by the labor bargaining centralization. We use a sample of 253238 firm-year observations from 32 countries between 1992 and 2013. Panel A shows the regressions of *Dividends*. *Dividend*s is defined as the ratio of dividends to assets. *Centralization* is an indicator of the degree of labor bargaining centralization in a country from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions of Dividends

	Dividends			
	OLS		The Second Stage of 2SLS	
	Centralization < Median	Centralization ≥ Median	Centralization < Median	Centralization ≥ Median
Intercept	-0.041	-0.031	-0.102	-0.123
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	0.064	0.242	0.199	0.472
	(0.01)	(0.01)	(0.01)	(0.01)
Size	0.001	0.001	0.001	0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.003	0.002	0.003	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.012	-0.005	-0.011	-0.005
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	-0.007	-0.002	-0.006	-0.003
	(0.01)	(0.03)	(0.01)	(0.02)
Cash Flow	0.035	0.008	0.035	0.008
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	-0.002	-0.004	-0.003	-0.004
	(0.84)	(0.01)	(0.02)	(0.01)
Working Capital	0.004	-0.005	0.004	-0.005
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.063	-0.008	-0.047	-0.009
	(0.01)	(0.24)	(0.01)	(0.18)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	126099	127139	126099	127139
Adjusted R-square	0.20	0.10	0.20	0.10
Over-identifying Restrictions Test (p-value)			0.58	0.39
Hausman Test (p-value)			0.01	0.01

Panel B. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by Centralization and reports the p-value of the t-test in the parentheses.

	Union Membership	
	OLS	Second Stage of 2SLS Estimation
Difference	-0.178	-0.273
(p-value)	(0.01)	(0.01)

Table 3-8 Announcement Return: The Increase of Dividends

This table shows the regressions about the announcement return of the increase of dividends. We use a sample of 56466 events of dividends increase from 55 countries between 1992 and 2013. CAR (-1, +1) is the cumulative abnormal return over days (-1, +1) around the announcement days. CAR (-3, +3) is the cumulative abnormal return over days (-3, +3) around the announcement days. CAR (-5, +5) is the cumulative abnormal return over days (-5, +5) around the announcement days. The cumulative abnormal return is calculated based on the market model. We use a firm's daily return and the return on its corresponding stock market index over days -200 to -20, where day 0 is the event date. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Cash* is defined as the ratio of cash and marketable securities to assets. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	CAR (-1, +1)	CAR (-3, +3)	CAR (-5, +5)
Intercept	0.053	0.055	0.048
	(0.01)	(0.01)	(0.01)
Union Membership	0.008	0.011	0.010
	(0.04)	(0.05)	(0.06)
Size	-0.002	-0.002	-0.002
	(0.01)	(0.01)	(0.01)
Tobin's Q	-0.003	-0.004	-0.005
	(0.01)	(0.01)	(0.01)
Leverage	0.002	0.003	0.004
	(0.21)	(0.24)	(0.14)
Capital Expenditure	-0.012	-0.003	-0.003
	(0.01)	(0.63)	(0.70)
Cash Flow	0.019	0.030	0.040
	(0.01)	(0.01)	(0.01)
R&D	0.008	0.006	0.001
	(0.34)	(0.62)	(0.92)
Working Capital	-0.001	-0.002	-0.002
	(0.59)	(0.39)	(0.43)
Industry Cash Flow Volatility	-0.019	-0.016	-0.033
	(0.39)	(0.60)	(0.36)
Cash	0.001	0.003	0.003
	(0.02)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	56466	56466	56466
Adjusted R-square	0.02	0.02	0.02

Table 3-9 Announcement Return: The Decrease of Dividends

This table shows the regressions about the announcement return of the decrease of dividends. We use a sample of 31816 events of dividends decrease from 55 countries between 1992 and 2013. CAR (-1, +1) is the cumulative abnormal return over days (-1, +1) around the announcement days. CAR (-3, +3) is the cumulative abnormal return over days (-3, +3) around the announcement days. CAR (-5, +5) is the cumulative abnormal return over days (-5, +5) around the announcement days. The cumulative abnormal return is calculated based on the market model. We use a firm's daily return and the return on its corresponding stock market index over days -200 to -20, where day 0 is the event date. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Cash* is defined as the ratio of cash and marketable securities to assets. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	CAR (-1, +1)	CAR (-3, +3)	CAR (-5, +5)
Intercept	0.019	0.027	0.040
	(0.01)	(0.01)	(0.01)
Union Membership	-0.008	-0.011	-0.015
	(0.03)	(0.02)	(0.07)
Size	0.000	0.000	-0.001
	(0.02)	(0.09)	(0.02)
Tobin's Q	-0.002	-0.003	-0.003
	(0.01)	(0.01)	(0.01)
Leverage	0.001	0.002	0.003
	(0.72)	(0.57)	(0.53)
Capital Expenditure	-0.020	-0.028	-0.029
	(0.01)	(0.01)	(0.01)
Cash Flow	0.021	0.018	0.017
	(0.01)	(0.02)	(0.06)
R&D	0.015	0.015	-0.030
	(0.25)	(0.37)	(0.14)
Working Capital	-0.001	0.000	-0.003
	(0.56)	(0.87)	(0.34)
Industry Cash Flow Volatility	-0.007	-0.036	-0.013
	(0.85)	(0.45)	(0.81)
Cash	0.001	0.000	0.001
	(0.24)	(0.70)	(0.60)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	31816	31816	31816
Adjusted R-square	0.01	0.01	0.01

Table 3-10 Change in Operating Performance: Dividend Increases

This table shows the regressions about the change in operating performance around the event of dividend increases. We use a sample of 56466 events of dividend increases from 55 countries between 1992 and 2013. ΔROA is the change in ROA from year t-1 to year t+1, where ROA is defined as the ratio of EBIT to assets. ΔNet ROA is defined as the difference between an event firm's change in ROA and its matched comparable firm's change in ROA from year t-1 to year t+1. We get comparable firms based on the matching with size and M/B in the same industry (Column 2) and propensity score matching (Column 3). *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	ΔROA	ΔNet ROA	
		Industry, Size and M/B Matching	Propensity Score Matching
Intercept	0.005	0.068	-0.007
	(0.33)	(0.01)	(0.37)
Union Membership	0.029	0.018	0.017
	(0.01)	(0.03)	(0.01)
Size	0.001	-0.002	0.001
	(0.29)	(0.01)	(0.01)
Tobin's Q	0.007	0.012	0.007
	(0.01)	(0.01)	(0.01)
Leverage	0.003	-0.001	-0.003
	(0.21)	(0.88)	(0.35)
Capital Expenditure	-0.038	-0.016	-0.047
	(0.01)	(0.12)	(0.01)
R&D	0.051	0.007	0.047
	(0.01)	(0.71)	(0.01)
Working Capital	0.002	0.001	0.001
	(0.22)	(0.59)	(0.60)
Industry Cash Flow Volatility	0.043	-0.056	-0.011
	(0.08)	(0.25)	(0.76)
ROA t-1	-0.344	-0.310	-0.381
	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	50459	50459	52436
Adjusted R-square	0.19	0.04	0.08

Table 3-11 Change in Operating Performance: Dividend Decreases

This table shows the regressions about the change in operating performance around the event of dividend decreases. We use a sample of 31816 events of dividends decrease from 55 countries between 1992 and 2013. ΔROA is the change in ROA from year t-1 to year t+1, where ROA is defined as the ratio of EBIT to assets. ΔNet ROA is defined as the difference between an event firm's change in ROA and its matched comparable firm's change in ROA from year t-1 to year t+1. We get comparable firms based on the matching with size and M/B in the same industry (Column 2) and propensity score matching (Column 3). *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Cash flow Volatility* is defined as the standard deviation of the median of Cash Flow in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	ΔROA	ΔNet ROA	
		Industry, Size and M/B Matching	Propensity Score Matching
Intercept	0.007	0.010	0.002
	(0.27)	(0.37)	(0.85)
Union Membership	-0.008	-0.016	-0.009
	(0.06)	(0.04)	(0.02)
Size	0.001	0.001	0.001
	(0.16)	(0.50)	(0.03)
Tobin's Q	0.002	0.007	0.004
	(0.01)	(0.01)	(0.01)
Leverage	0.008	0.010	0.003
	(0.01)	(0.06)	(0.47)
Capital Expenditure	-0.022	0.017	0.005
	(0.01)	(0.18)	(0.64)
R&D	0.065	0.112	0.001
	(0.01)	(0.01)	(0.99)
Working Capital	0.001	0.002	0.004
	(0.88)	(0.60)	(0.17)
Industry Cash Flow Volatility	-0.042	0.014	-0.062
	(0.22)	(0.83)	(0.22)
ROA t-1	-0.350	-0.315	-0.413
	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	28290	28920	30080
Adjusted R-square	0.18	0.04	0.09

Table 3-12 Dividends and Labor Costs

This table shows OLS regressions about dividends and labor costs for the sub-groups separated by union membership. We use a sample of 77380 firm-year observations from 63 countries between 1992 and 2013. Panel A shows the regressions. *Log (Average Labor Costs)* is defined as the logarithm of average labor costs, where average labor costs are the ratio of staff expenses to the number of employees. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Dividends* is defined as the ratio of dividends to assets. *Size* is defined as the logarithm of market value of assets. *Leverage* is defined as the ratio of long-term debts to market value of assets. *Average Sales per Employee* is the ratio of sales to the number of employees. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Tangibility* is the ratio of plant, property and equipment to assets. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Corporate Cash Holdings between the two sub-groups.

Panel A. Regressions

	Log (Average Labor Costs)	
	Union Membership < Median	Union Membership ≥ Median
Intercept	5.962	7.763
	(0.01)	(0.01)
Dividends	-0.267	-0.350
	(0.07)	(0.01)
Size	0.038	0.003
	(0.01)	(0.33)
Leverage	0.141	-0.008
	(0.01)	(0.84)
Average Sales per Employee	0.672	0.431
	(0.01)	(0.01)
Tobin's Q	-0.005	0.021
	(0.35)	(0.01)
Tangibility	-0.344	-0.085
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	38981	38399
Adjusted R-square	0.50	0.45

Panel B. Difference in the Coefficients of Dividends

The following table shows the difference in the coefficients of Dividends between the two sub-groups separated by union membership and reports the p-value of the t-test in the parentheses.

	Dividends
Difference	0.083
(p-value)	(0.01)

Table 3-13 Dividends and Strikes & Lockouts: Country-level Analysis

This table shows an OLS regression on the country-level analysis about Dividends and Strikes & Lockouts. We convert all firm-level variables into country-level variables by taking the average of the variables across the countries. The sample includes 781 country-year observations between 1992 and 2013 from 52 countries. *Strikes & Lockouts* are defined as the total number of strikes and lockouts in a country. *Dividend*s is defined as the ratio of dividends to assets. *Labor Force* is defined as the sum of all persons of working age who are employed and those who are unemployed. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Dividend*s is defined as the ratio of dividends to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of working capital and marketable securities to assets. *Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p-value is noted in the parentheses.

	Log (Country-level Strikes & Lockouts + 1)
Intercept	-26.667
	(0.01)
Country-level Dividends	-9.218
	(0.08)
Log (Country-level Labor Force)	1.432
	(0.01)
Country-level Size	0.099
	(0.33)
Country-level Tobin's Q	-0.078
	(0.24)
Country-level Leverage	-1.994
	(0.12)
Country-level Capital Expenditure	-2.192
	(0.34)
Country-level Cash Flow	1.368
	(0.32)
Country-level R&D	5.155
	(0.39)
Country-level Working Capital	-0.363
	(0.68)
Country-level Cash Flow Volatility	-3.300
	(0.80)
Year Dummy Variables	YES
Industry Dummy Variables	YES
Country Dummy Variables	YES
Number of Observations	781
Adjusted R-square	0.88

Table 3-14 Robustness Check: Gender Gap

This table shows the second-stage regressions of the 2SLS estimation for the sub-groups separated by the Gender Gap. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. Panel A shows the regressions. *Gender Gap* index is from the World Economic Forum and is constructed based on the equality between women and men across four key areas: health, education, economy and politics (see text for details). *Dividend*s is defined as the ratio of dividends to assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions

	Dividends	
	Second Stage of 2SLS	
	Gender Gap < Median	Gender Gap ≥ Median
Intercept	-0.012	-0.039
	(0.01)	(0.01)
Union Membership	0.023	0.111
	(0.01)	(0.01)
Size	0.001	0.001
	(0.01)	(0.01)
Tobin's Q	0.001	0.003
	(0.01)	(0.01)
Leverage	-0.012	-0.007
	(0.01)	(0.01)
Capital Expenditure	0.012	-0.008
	(0.01)	(0.01)
Cash Flow	0.030	0.018
	(0.01)	(0.01)
R&D	0.010	0.004
	(0.01)	(0.01)
Working Capital	0.007	-0.005
	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.042	-0.036
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	239191	116524
Adjusted R-square	0.17	0.12
Over-identifying Restrictions Test (p-value)	0.26	0.41
Hausman Test (p-value)	0.01	0.01

Panel B. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by Gender Gap and reports the p-value of the t-test in the parentheses.

	Union Membership
Difference	-0.088
(p-value)	(0.34)

Table 3-15 Robustness Check: Collective Bargaining Coverage Rate

This table shows the robustness check by using Bargaining Coverage Rate as an alternative measure of bargaining power. We use a sample of 326262 firm-year observations from 55 countries between 2000 and 2013. In Panel A, we report the OLS regression and the second stage of two-stage least square estimation. *Dividend*s is defined as the ratio of dividends to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Collective Bargaining Coverage Rate* is calculated as the number of employees whose pay and/or conditions of employment are determined by one or more collective agreement(s) in a country divided by the total number of employees in that country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Cash* is defined as the ratio of cash and marketable securities to assets. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. Panel B report the regressions about the announcement return around the event of dividend increases and dividend decreases. The p-value is noted in the parentheses. The p-value is noted in the parentheses.

Panel A. Collective Bargaining Coverage Rate and Corporate Payout

	Dividends	
	OLS	The Second Stage of 2SLS
Intercept	-0.006	-0.003
	(0.01)	(0.01)
Collective Bargaining Coverage Rate	0.009	0.016
	(0.01)	(0.01)
Size	0.001	0.001
	(0.01)	(0.01)
Tobin's Q	0.002	0.002
	(0.01)	(0.01)
Leverage	-0.010	-0.008
	(0.01)	(0.01)
Capital Expenditure	0.001	0.002
	(0.04)	(0.01)
Cash Flow	0.020	0.020
	(0.01)	(0.01)
R&D	0.007	0.010
	(0.01)	(0.01)
Working Capital	0.001	0.001
	(0.05)	(0.03)
Industry Cash Flow Volatility	-0.072	-0.064
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	326262	326262
Adjusted R-square	0.12	0.10
Over-identifying Restrictions Test		0.28
Hausman Test		0.01

Panel B. Collective Bargaining Coverage Rate and Announcement Return

	Dividend Increases			Dividend Decreases		
	CAR (-1, +1)	CAR (-3, +3)	CAR (-5, +5)	CAR (-1, +1)	CAR (-3, +3)	CAR (-5, +5)
Intercept	0.050	0.053	0.057	0.020	0.033	0.052
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Collective Bargaining Coverage Rate	0.010	0.011	0.012	-0.024	-0.046	-0.055
	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)	(0.01)
Size	-0.001	-0.002	-0.002	0.001	0.001	-0.001
	(0.01)	(0.01)	(0.01)	(0.17)	(0.48)	(0.12)
Tobin's Q	-0.002	-0.003	-0.004	-0.002	-0.002	-0.002
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.003	0.004	0.005	0.001	0.003	0.005
	(0.19)	(0.15)	(0.08)	(0.61)	(0.42)	(0.24)
Capital Expenditure	-0.014	-0.004	-0.007	-0.025	-0.039	-0.045
	(0.01)	(0.60)	(0.41)	(0.01)	(0.01)	(0.01)
Cash Flow	0.014	0.026	0.033	0.018	0.010	0.011
	(0.01)	(0.01)	(0.01)	(0.01)	(0.24)	(0.23)
R&D	0.009	0.001	-0.007	0.017	0.014	-0.027
	(0.34)	(0.95)	(0.61)	(0.19)	(0.42)	(0.19)
Working Capital	-0.001	-0.003	-0.003	-0.001	0.001	-0.003
	(0.45)	(0.18)	(0.29)	(0.57)	(0.89)	(0.35)
Industry Cash Flow Volatility	-0.012	-0.017	-0.029	-0.009	-0.029	-0.007
	(0.60)	(0.59)	(0.43)	(0.80)	(0.56)	(0.91)
Cash	0.001	0.002	0.003	0.001	0.001	0.001
	(0.06)	(0.01)	(0.02)	(0.22)	(0.83)	(0.62)
Year Dummy Variables	YES	YES	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES	YES	YES
Number of Observations	49079	49079	49079	26332	26332	26332
Adjusted R-square	0.02	0.02	0.02	0.01	0.01	0.02

Chapter 4 Labor Unions and Share Repurchases: Evidence from International data

4.1 Introduction

Dividends and share repurchases are two main methods for firms to distribute financial resources all around the world. As discussed in chapter 3, firms use dividends as a bargaining tool against labor unions across countries. Share repurchase is also used as a flexible way in collective bargaining in the world. However, few financial economists explore the relation between share repurchases and labor unions in the international setting.

Share repurchases grow rapidly during the 1980s and 1990s in many countries Grullon and Michaely (2004) state that the value of share repurchases firstly exceed that in dividends payment in US industrial companies in 1999 and 2000. Share repurchases also increase in Canada (Ikenberry, Lakonishok, and Vermaelen, 2000), United Kingdom (Oswald and Young, 2004) and other European countries (Eije and Megginson, 2008). In Japan and Sweden, share repurchases are prohibited before but are allowed in open markets since the 1990s (Tong, and Bremer, 2016; Tran, and Weigardh, 2013).[36] Corresponding with the popularity of share repurchases around the world, financial economists conduct extensive research about the share repurchases. However, most papers focus on US markets (e.g., Comment, and Jarrell, 1991; Grullon, and Michaely, 2002; Skinner, 2008).

Motivated by previous studies, this chapter investigates the relation between labor unions and share repurchases in the international setting. First, share repurchases play a significant role in firms' financial policies all around the world. Share repurchases reduce the resources available to a firm, which also reduce the resources available for potential collective bargaining

[36] Share repurchases are allowed in legal in Japan in 1995 while they are allowed in Sweden in 2000.

organized by labor unions. It implies that a firm may strategically choose share repurchases with the presence of labor unions. For example, suppose a firm has a lot of cash holdings, labor unions recognize this and may organize the collective bargaining to get more benefits for the workers. Then suppose a firm pays out the cash by share repurchases, this reduces cash holdings in the firm and reduce the likelihood of the occurrence of the collective bargaining organized by labor unions.

Second, previous literature has examined how labor unions affect share repurchases by using the US data (e.g., Chen, Chen, and Wang, 2015). Since labor unions exist in many countries around the world, as discussed in previous chapters, there is a substantial difference between the US and other countries in the world. Therefore, it is meaningful to use a more effective research setting on the relation between labor unions and share repurchases in international settings.

Third, previous literature has found different results in terms of the relation between labor unions and corporate financial policies by using US data and international data separately. As discussed in previous chapters, Matsa (2010) and Simintzi, Vig, and Volpin (2015) find the opposite results about leverage by using US data and the international data separately. Therefore, it is possible that the impacts of labor unions on share repurchases are different between the US data and the international data. This motivates us to examine the relation between labor unions and share repurchases in the international setting.

This chapter develops two hypotheses. First, the bargaining hypothesis argues that firms strategically choose share repurchases to gain the bargaining positions against labor unions. On one hand, when a firm repurchase more stocks, it increases the risk of the shortage of corporate liquidity. As a result, labor unions will decrease their demands for benefits from the firm due to the consideration of bankruptcy risk. On the other hand, suppose a firm has a higher level of share repurchases, it sends out a positive signal about future profitability. Moreover, this may

also reveal that the firm is less financially constrained. To avoid this positive signaling which increases the likelihood of the occurrence of collective bargaining organized by labor unions, a firm will reduce the share repurchases to prevent sending out such kind of positive signals. Therefore, the bargaining hypothesis predicts that the relation between labor unions and share repurchases in two possible directions through two different mechanisms.

Second, the operating leverage hypothesis suggests that stronger labor unions increase both operating risk and rigidity of labor costs, leading to lower share repurchases based on the trade-off perspective. Because with the presence of strong labor unions, a firm will have higher expenditures due to the higher rigidity of labor costs. According to the trade-off perspective, the firm needs to hold more cash to meet the demand for higher expenditures. Meanwhile, the strong labor unions are also associated with a higher operating risk. Accordingly, this firm also needs to hold more cash due to the precautionary motive. In this case, this firm will reduce the share repurchases. Therefore, the operating leverage hypothesis predicts that there is a negative relation between the strength of labor unions and share repurchases.

We use a sample of 355715 firm-year observations from 66 countries in our empirical analysis. We use the country-level union membership to measure the bargaining power of labor unions across countries. It is defined as total number of trade union members to the total number of paid employees in a country. In terms of the potential endogeneity problem, we apply the instrumental variables approach in our analysis to study the relation between union membership and share repurchases. In addition, we conduct the relevant tests to ensure our instruments are valid and exogenous.

We find that firms use share repurchases to gain bargaining position to labor unions. When there is higher union membership in a country, firms tend to have more share repurchases. Our results show that a one standard deviation increase in the country-level union membership leads to a 0.010 increase in the level of share repurchases and a 0.024 increase in the level of

total payout, corresponding to an increase in share repurchases with a dollar value of 1.600 million dollars and an increase in total payout with a dollar value of 3.876 million dollars. In addition, we divide our sample into sub-groups concerned with characteristics that can affect the bargaining power of labor unions. We find that the positive relation between country-level union membership and share repurchases is stronger for firms in countries with weaker employment protection legislation and firms in countries with a higher degree of labor bargaining centralization.

Because of this positive relation, we conduct event study about how the country-level union membership affects the market response around the date of share repurchase. We find that the announcement return is higher for firms in a country with higher union membership around the announcement date of share repurchase. Moreover, we examine how labor unions affect the operating performance around the event of share repurchases. We find that the net ROA change is positively correlated with the union membership around the event date of share repurchase.

Our findings are consistent with the bargaining hypothesis from the perspective of the availability of resources. They imply that a strategically choose share repurchases to gain bargaining advantage against labor unions in the international setting.

We contribute to the literature from the following aspects. First, our results based on international data are different from the results in the previous literature based on US data. For example, Chen, Chen and Wang (2015) find a negative relation between the level of firms' share repurchases and labor power measured by unionization rates with US data. Moreover, they find a negative relation between labor power and both the announcement returns and the operating performance of the event of share repurchases. Their interpretation of their results is that firms are less likely to repurchase shares with the presence of stronger labor unions because labor unions will get tougher after firms repurchase shares, which weakens firms' bargaining

positions. However, our paper finds the opposite results. We find that firms have a higher level of share repurchases with the presence of stronger labor unions by using international data. In addition, we find that the announcement returns and the operating performance of the event of share repurchases are higher with the presence of stronger labor unions. Our interpretation of our results is that firms strategically use share repurchase to gain bargaining positions with the labor because share repurchases will lower the resources available for collective bargaining. Therefore, the findings of our paper are opposite the findings of Chen, Chen and Wang (2015).

Second, we add to the literature of share repurchases in corporate finance by providing a new piece of evidence in the international setting. In the literature of corporate repurchases, most papers use US data, while only a limited number of papers study share repurchases in the international setting. For example, Manconi, Peyer and Vermaelen (2015) investigate share repurchases across countries from the perspectives of market timing, governance quality and regulations. Our research differs from their paper because we study share repurchases from the perspective of the bargaining between labor unions and firms. For another example, Eije and Megginson (2008) examine the payout policy in 15 members of European Union, they examine the level of share repurchases and find that financial reporting frequency and privatization affect both the level of share repurchases and the likelihood that a firm conducts share repurchases. Our paper differs from their paper, because we focus on the relation between labor unions and share repurchases, and we examine not only the level but also the value impact associated with the announcement of share repurchases in a broader sample with the data from 66 countries.

Broadly speaking, our paper also contributes to the literature by presenting a new piece of evidence regarding the comparison of the findings between US data and international data in the field of collective bargaining with labor. For example, Matsa (2010) finds positive relation between leverage and labor unions with US data and argue that firms strategically set

leverage to get stronger bargaining positions. However, Simintzi, Vig, and Volpin (2015) find opposite results and argue that leverage is not regarded as a bargaining tool in the international data. For another example, as we discussed in Chapter 2, while Klasa, Maxwell and Ortiz-Molina (2009) find that there is a negative relation between corporate cash holdings and labor unions using US data, we find similar results of such a negative relation by using the international data. From these two examples, the findings in previous literature reveal that the results may be either different or similar when US data or international data are used, and that there is not a systematic pattern. Therefore, it is meaningful to conduct another research on the relation between labor power and share repurchases in the international setting, although Chen, Chen, and Wang (2015) have already examined this issue with US data.

The paper is organized as follows. Section 2 reviews the literature. Section 3 develops the hypotheses. Section 4 describes the data and the variables. Section 5 discusses the methodology. Section 6 presents the results of large sample analysis. Section 7 shows the results of smaller sample analysis. Section 8 describes robustness check. Section 9 concludes this chapter.

4.2 Literature Review

Grullon and Michaely (2004) point out that the total value of share repurchases exceeds the value of dividend payments in US industrial companies in 1999. Share repurchases attract dramatic attention from financial economists.

Existed literature notes that firms repurchase stocks under the similar mechanism as dividend payments that both dividend payments and share repurchase are used to distribute cash to shareholders. Accordingly, theories about share repurchase are related to the theories about dividends. Based on the seminal study of Lintner (1956) and Miller and Modigliani (1961), financial economists develop the signaling theory and the agency theory. However, Jagannathan, Stephens and Weisbach (2000), and Guay and Harford (2000) argue that firms

buyback shares to distribute transient and temporary cash flows while they pay out dividends to distribute the permanent cash flows. Firms use share repurchases as a more flexible substitute for dividend payments. There is also some paper study the dividend substitution theory about share repurchases.

Therefore, this section reviews the literature about two main theories related to share repurchases: signaling theory, agency theory.

4.2.1 Signaling theory

Similar to the literature about dividend policy, financial economists build the signaling theory about share repurchases. Managers buyback stocks to signal future profitability and undervaluation of this firm. Vermealen (1981) proposes the signaling theory in the literature of share repurchase based on two assumptions: information asymmetry and undervaluation. He describes the share repurchase activities as positive signals to shareholders. He examines the stock price around the announcement date of share repurchase and finds a significant level of increase in the stock price around that date.

Early literature tries to find evidence supporting the signaling theory of share repurchases by connecting future earnings growth to share repurchase announcements. For example, Dann (1981) studies 143 cash tender offers made by 122 US firms between 1962 and 1976 to test firms' value change affected by share repurchases. He finds that the value of firms increases in the day of tender offer announcement due to the positive signaling effects of share repurchases. Ofer and Thakor (1987) compare the different effects of dividend payments and share repurchases on signaling firms' value by a theoretical model. They show that the market response of share price to dividend announcements is weaker than that to share repurchase announcements. They suggest that managers can use dividends or share repurchases to correct the undervaluation of firms' stocks in different situations. Dann, Masulis and Mayers (1991) include systematic risks of stocks in their signaling model by using 122 tender offers by 101

US firms from 1969 to 1978. They find that analysts' forecast errors and firms' earnings surprises are positive related to the tender offer announcement. They show that the increases in firms' quarterly earnings reports lead to positive stock price reactions and argue that is because firms' tender offer announcements are positive signals. Bartov (1991) also find consistent results with signaling theory by using the data of open market share repurchases and state it is a "weak" evidence because they find positive stock price reactions to share repurchases in that year.

More literature finds positive market reaction to the announcements of share repurchases because the stock price is undervalued. For example, Comment and Jarrell (1991) propose that there are three types of share repurchases in the US: Dutch auction self-tender offer, fixed price self-tender and open market share repurchase. They compare the positive effects of signals among these three methods and argue that the fixed price self-tenders send the strongest signals of undervaluation. Following the comparison methods of Ofer and Thakor (1987), Choi and Chen (1997) add timing, industry and the cash distribution amount in control variables and find the market response to repurchase tender offer announcements stronger than the response to dividend increases. Stephens and Weisbach (1998) support the signaling theory by examining the abnormal return of share repurchase announcement date and emphasize that firm size is an important negative determination of the abnormal return of the announcement day. More recently, Liu and Swanson (2016) find that firms buyback stocks to provide price support with a sample of US firms over the period of 2003-2014. They find that there are positive abnormal returns after managers repurchase stocks that are motivated by price support. Because managers are confident about firms' stock prices and would provide price support to stocks by share repurchases. Damien, Michael and Alfred (2011) also find evidence from Australian data.

However, some literature shows that share repurchases are not positive signals to shareholders. For example, Pettit (2001) argue that share repurchase announcements sometimes

send a negative signal to shareholders because firms in emerging industries may not find other more profitable investments than themselves. For another example, Chan, Ikenberry, Lee, and Wang (2010) use the data of US firms that announce share repurchases in open markets between 1980 and 2000 and argue that announcements of share repurchases may convey false signals when managers under the pressure of current low stock price. They find that managers in firms with poor earnings quality experience heavy pressure and they announce share repurchases only to give a boost to share price.

4.2.2 Agency theory and free cash flow theory

The rationale of agency theory of share repurchases is also similar to the agency theory of dividends discussed above in Section 3.2.2. As another way to distribute cash, share repurchases also reduce the free cash flow and decrease the agency costs.

Howe, He, and Kao (1992) investigate in whether tend offer share repurchases decrease the agency problems for the years 1979 to 1989 by using the similar methodology of Lang and Litzenberger (1989). However, they find that there is no significant difference in market reaction to share repurchase announcements across firms with different Tobin's Q. They argue that firms repurchase shares are not for the purpose of lowering agency costs. However, Perfect, Peterson, and Peterson (1995) find significant difference of market reaction to share repurchase announcements between firms with high Tobin's Q and low Tobin's Q under similar methodology of Lang and Litzenberger (1989). They use the mean of Tobin's Q over three years prior to the repurchase announcement instead of the current Tobin's Q which is used in Howe, He and Kao (1992). They find firms with high Tobin's Q have weaker market reaction to share repurchases than firms with low Tobin's Q, and argue that it is consistent with agency theory. Vafeas and Joy (1995) find empirical evidence from open market repurchases by using 162 share repurchases from The Wall Street Journal from 1985 to 1991. They find the abnormal return of repurchase implies that open market repurchases reduce the free cash flow leading to

less agency costs. Nohel and Tarhan (1998) find similar results from both fixed-price and Dutch-auction tender offers between 1978 and 1991by using the methodology of Lang and Litzenberger (1989). Evans, Evans & Gentry (2003) extend the sample period to 1978 to 1995 on The Wall Street Index and find that firms' free cash flows significantly decreases after share repurchases which is consistent to the agency theory. Grullon and Michaely (2004) find that the announcements of share repurchase in open markets are not associated to operating performance growth and argue this is inconsistent with the signaling theory which predicts positive earnings growth following the share repurchases. However, they find positive effects of share repurchase announcements on the market reaction and the effects are stronger in firms are more likely to overinvest. They argue this is consistent with the free cash flow theory of share repurchase.

Recently, Jagannathan and Stephens (2003) compare financial characteristics and market performance between frequently repurchasing firms to occasionally repurchasing firms for the period of 1986-1996. They note that firms occasionally repurchase stocks in open markets have more operating income volatility, lower institutional ownership and more abnormal return after announcements of share repurchases. They argue that the high abnormal return indicates that share repurchase decreases the agency costs. Padgett and Wang (2007) also find significant positive effects of announcements of share repurchases on firms' stock price by using the data of UK firms from 1999 to 2004. Oswald and Young (2007) also use data of firms listed in London Stock Exchange between 1995 to 2003 and find firms with lower managerial ownership are under stronger board monitoring so that they have better operating performance after share repurchase announcements due to the lower level of agency problems. Chahine, Zeidan and Dairy (2012) provide more evidence from corporate governance.

However, different from the traditional agency theory in payout policy and residual theory of dividends, Almeida, Fos and Kronlund (2016) find empirical evidence that the

propensity of share repurchases in firms whose EPS is far from analysts' forecast but have not repurchased stocks is sharply higher than firms whose EPS "just beat" analysts' forecast. They argue that there may be a tradeoff between investments and share repurchases when managers have the incentive to meet analysts' forecast. Since share repurchase leads to positive market response of earnings per share (EPS) increases, managers strategically lower the employment and investments to repurchase stocks in open market. As a result, managers meet the analysts' EPS forecast by share repurchasing.

4.2.3 Other Theories

4.2.3.1 Dividend substitution hypothesis

Managers use repurchase instead of dividend payments to distribute cash to shareholders because repurchases are more flexible. Brav, Graham, Harvey, and Michaely (2005) survey 384 financial executives and highlight that executives prefer repurchases because of the flexibility. Jagannathan, Stephens, and Weisbach (2000), and Guay and Harford (2000) also point that firms buyback shares to distribute transient and temporary cash flows while they pay out dividends to distribute the permanent cash flows. Firms use share repurchases as a more flexible substitute for dividend payments. In addition, Evans, Evans & Gentry (2003) argue that firms decrease dividends may lead to heavy penalty so that firms use share repurchase when there is excess cash to avoid dividends adjustments. Therefore, firms use share repurchase as a flexible substitute of dividends.

Allen and Michaely (2003) state that dividends increases approximately 15% per year before mid-1980s and this growth rate declines to average 6% per year after mid-1980s because firms are substituting share repurchases for dividends as their payout policy. In 1999, the value of share repurchases arrived at the same level of dividend payments. However, Dunsby (1995) compares the dividend payments between firms with share repurchase activities and firms do not repurchase in the mid-1980s. He finds firms with share repurchase activities pay dividends

no less than comparable firms although there are increasing share repurchase activities in his sample period. Fama and French (2001) have also observed the increasing share repurchase since 1978. They suggest that firms generally increase total payout, especially large and profitable firms which results in the repurchase growth. Fenn and Liang (2001) find evidence supporting the dividend substitution theory by using US data from 1993 to 1997. They find management stock options are negatively related to dividend payments while are positively related to share repurchases. The opposite relations therefore inspire managers to use share repurchases to attribute cash instead of dividend payments.

According to Jagannathan, Stephens and Weisbach (2000), and Guay and Harford (2000), firms prefer share repurchase to attribute transient cash flows. Gasper, Massa, Matos and Patgiri (2004) study US firms over a period of 1984-2000 and find firms with more short-term institutional investors prefer to share repurchases rather than dividend payments. They also state that the abnormal return of share repurchases are higher than that of dividend payments. Chay and Suh (2008) examine the relation of firms' payout method decision and cash flow volatility in the US between 1994 and 2005. They find firms with high cash-flow volatility prefer share repurchase because dividend payments are sticky. They argue this is consistent with Grullon and Michaely (2002), and Grullon and Michaely (2002) which predict that firms repurchase shares but do not pay dividends have higher operating profitability. Lee and Suh (2011) study the payout policy in seven main countries from 1998 to 2006. They find that share repurchases are used as a flexible way to distribute temporary cash flows across countries, although non-US firms have less share repurchase than US firms. Their results are consistent to the agency theory and dividend substitution theory.

However, DeAngelo, DeAngelo and Skinner (2008) emphasize that dividends increase with the growth of share repurchases recently because large and mature firms use dividends to deal with the free cash flow problems. Floyd, Li and Skinner (2015) also confirm that dividends

grow steadily with share repurchases. They find evidence that the ratio of dividends to total payout stays stable after 2000 because the free cash flow problems exit. They therefore suggest that share repurchases are used as a supplement of dividends.

4.2.3.2 Executive stock option and repurchase

As discussed in 3.2.3.2, dividend payments reduce the price of stock options (Lambert, Lanen and Larker, 1989). Managers prefer to repurchase stocks rather than to pay out dividends to distribute internal funds. As a result, the higher ownership of executive stock options is associated with more share repurchases. For example, Fenn and Liang (2001) state that both the number of managerial stock options and share repurchases increases over the period of 1993-1997 in the US. They argue that managers change the composition of payout policy with higher share repurchases in that they have incentives to protect the price of their stock options. For another example, Kahle (2001) studies the relation between employees' stock options and repurchases by using the data of 5147 share repurchases between 1991 and 1996. She finds that firms' share repurchases are positively affected by all employees' stock options exercisable and the market response to this kind of repurchases is weaker because managers use repurchases to maximize their own benefits.

Moreover, suppose executives have stock options as compensation, when managers exercise the stock options, this can increase the total number of shares outstanding. Consequently, this will dilute the earnings per share (EPS). To prevent the dilution of EPS, firms repurchase shares to reduce the total number of shares outstanding. For example, Jolls (1998) examine the dilution loss when firms paid out dividends to distribute cash in 1993. He suggests firms increase dividends rather than repurchases experience $345, 000 loss of its value due to the dilution. They also find that higher level of stock options is associated with higher probability of share repurchases and lower probability of dividend increases. Moreover,

Weisbenner (2000) also finds that stock options held by top five executives are positively related to share repurchases in the US in 1994.

4.2.3.3 Optimal Capital Structure Hypothesis

Due to the different taxation between dividends and capital gains, firms repurchase stocks to gain lower tax rate. If firms finance the share repurchases with debt, firms may use share repurchases to a more desirable capital structure because firms can use repurchase from cheaper debt financing to replace the expensive equity financing. For example, Dixon, Palmer, Stradling and Woodhead (2008) survey the finance directors of top 200 UK firms. They suggest that firms' finance directors strategically use share repurchases to achieve the optimal capital structure. Moreover, Rau and Vermaelen (2002) find that share repurchases in UK firms are sensitive to the tax changes. They argue that although most open-market repurchases use excess cash rather than debts, firms also benefit from the lower tax rate of capital gains and cash is considered as negative debt.

4.2.3.4 Behavioral finance hypothesis

Previous literature also uses behavioral finance to study the share repurchases, because behavioral finance predicts well in some underreaction and overaction problems which cannot be explained by classic theories.

For example, Ikenberry, Lakonishok, and Vermaelen (1995) find that the market reacts slowly to share repurchase in a long time. They argue that that the firms' long-term positive performance after share repurchases is associated with the market underreaction. However, Fama (1998) point out the bad-model problem is more serious in the long-term performance after share repurchases in that the market is inefficient. Recently, Cheng, Yan, Zhao, and Gao (2015) try to explain the anomaly of market reaction to share repurchases in Taiwan with the investor inattention hypothesis. They use the turnover as the proxy of investor inattention because investors may have limited information about the stock with less turnover, and argue

that the information is not fully reflected by the price. They find that stocks with less previous turnover are associated with greater underreaction to the announcements of share repurchases and greater long-term positive abnormal return.

4.3 Hypothesis

This section describes the hypothesis development.

4.3.1 Bargaining hypothesis

Based on bargaining perspective, labor unions have effects on firms' share repurchases in two following ways.

4.3.1.1 The channel through the availability of resources and bankruptcy risk

It has been found in literature that corporate financial policies are affected by collective bargaining. For example, Matsa (2010) finds labor unions have impacts on a firm's capital structure. Klasa, Maxwell and Ortiz-Molina (2009) find that corporate cash holdings are affected by the bargaining power of labor unions. According to this literature, firms strategically use various corporate financial policies to increase the bankruptcy risks with the presence of labor unions. Because bankruptcy is costly for employees, firms get more bargaining benefits from these financial policies. Therefore, labor unions will not claim more benefits and even accept lower wages with the variation of capital structure or the cash holdings decreases and other change of financial policies.

A firm can reduce the availability of resources through share repurchases. Guay and Harford (2000) state that firms choose to repurchase stocks in order to disburse transient cash-flow shocks. When a firm conducts a share repurchase program, it reduces the available financial resources and obtains a better bargaining position against labor unions. In addition, Brav et al. (2005) argue that managers prefer repurchases because they are more flexible than dividends from survey data. This flexibility can be used to vary payout to time the equity market. Therefore, share repurchases can also be used in collective bargaining for firms to gain

bargaining positions with labor unions. When firms conduct a share repurchase program, the bankruptcy risk increases. As discussed above, this increased bankruptcy can be used as a bargaining tool in the collective bargaining. For example, Chino (2016) finds that firms with higher profitability increase their dividend payments to gain bargaining positions when there are strong labor unions. He argues that firms use payout policies to reduce the rent extracted by potential collective bargaining of labor unions and this is consistent with the rent extraction hypothesis. Due to the above mechanism, firms will be expected to strategically increase share repurchases to gain bargaining power when there are strong labor unions. Therefore, the bargaining hypothesis is developed as followed.

Hypothesis 1A: The bargaining hypothesis predicts that there is a positive relation between labor unions and share repurchases through the channel of availability of resources and bankruptcy risk.

4.3.1.2 The channel through the signaling effect

Previous literature has discussed the signaling effects of share repurchases. For example, Vermaelen (1981) argues that a firm can use share repurchase program to signal future profitability. In this literature, a firm can send out credible signals through share repurchases.

When a firm increases the share repurchases, labor unions may view this as a signal of positive future profitability. In this case, labor unions will increase the demand for financial benefits from the firm because they will think that this firm has good potential for future profitability.

To avoid the higher demands from labor unions, a firm will strategically reduce share repurchases in advance, in that share repurchase programs send out a signal to encourage labor unions to increase their benefits claims. In addition, when there are stronger labor unions, this mechanism is more likely to occur because a firm can obtain more benefits from this strategical change of share repurchases. Therefore, the following hypotheses are developed.

Hypothesis 1B: The bargaining hypothesis predicts that there is a negative relation between labor unions and share repurchases through the channel of signaling.

4.3.2 Operating leverage hypothesis

Chen, Kacperczyk, and Ortiz-Molina (2011) argue that the presence of labor unions decreases the operating flexibility and increases the cost of equity of firms. Labor unions try to increase their benefits from firms' operating income. This increases the firms' fixed labor costs because labor unions make wage stickier and layoffs more costly. As a result, firms' operating leverage increases.

Firms have to keep some financial resources due to when there are strong labor unions who increases the operating risk. Simintzi, Vig, and Volpin (2015) find that the higher union density leads to higher labor costs which increase the higher operating leverage and lower financial leverage.

If firms have more share repurchases, they may suffer the operating risks due to insufficient financial resources. This operating leverage risk promotes firms reduce share repurchases when there is higher union membership in a country.

Hypothesis 2: The operating leverage hypothesis predicts that there is negative relation between labor unions and share repurchases.

Hypothesis 2: The operating leverage hypothesis predicts that there is a negative relation between labor unions and share repurchases.

4.3.3 Combining the hypotheses

The table below shows the hypothesis developed in the previous discussion. In this table, a positive sign "+" implies that the relation between the power of labor unions and the share repurchases is positive, while a negative sign "-" implies a negative relation.

The relationship between the strength of labor unions and share repurchases		
The bargaining hypothesis		The operating leverage hypothesis
The availability of resources	The signaling effect	
+	-	-

4.4 Data and Variables

4.4.1 Data

The sample comprises international data collected from following sources. The financial data of U.S. firms and Canadian firms are obtained from Compustat North America database. We obtain the financial data of firms in other countries from Compustat Global database. Since the data of non-the US firms use different currencies; The monthly exchange rates are used from Compustat Global database to convert these data to corresponding data in U.S. dollars. In order to calculate the industry cash flow volatility by using the data of prior five years, the sample period is from 1992 to 2013 although the data in Compustat Global database starts from 1987. The stock return data is obtained from the CRSP database for the US and Canadian firms. The stock return data for firms in other countries is obtained from Datastream database. We also obtain the data of stock market index in each country from Datastream database. The information of share repurchase events is obtained from Thomas One database. The country-level data of union membership from ILOStat database, which is maintained by the International Labor Organization.

Firms with less than 5 million U.S. dollars in total assets or market capitalization, financial firms (SICcodes between 6000 and 6999) and observations with incomplete data are excluded. These exclusion procedures follow the literature Pinkowitz, Stulz and Williamson (2013) to ensure that the data collected is valid for the following empirical analysis. After these exclusions, the final sample consists of 42777 firms with 355715 firm-year observations from 66 countries.

4.4.2 Variables

4.4.2.1 Union Membership

The variable Union Membership is calculated as the total number of trade union members divided by the total number of paid employees in a country. This variable is used as a measure

of the bargaining power of labor unions in a country. A higher level of Union Membership implies that the bargaining power of labor unions is higher in this country.

4.4.2.2 Share Repurchases

The variable Repurchases is defined as the ratio of repurchases to assets.

4.4.2.3 Control Variables

The control variables in this chapter are constructed as follows. Size is defined as the natural logarithm of total assets. Tobin's Q is defined as market value of equity plus total assets minus book value of equity, divided by total assets. Leverage is defined as the ratio of long-term debts to total assets. Capital Expenditures are defined as the ratio of capital expenditures to total assets. Dividends are defined as the ratio of dividends to total assets. Cash Flow is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. R&D is defined as the ratio of research and development expenses to total assets. Net Working Capital is defined as the ratio of working capital minus cash and marketable securities to total assets. Industry Cash Flow Volatility is calculated as the standard deviation of the median of Cash Flow in an industry classified by two-digit SIC codes in the prior five years. Year dummy variables, industry dummy variables and country dummy variables are also included in regressions.

To control the time-invariant characteristics across countries, previous literature uses different control variables in their study, such as shareholder rights (Dittmar et al., 2003), a dummy variable describing whether the law is based common law or civil in a country, the level of external capital La Porta et al., 1997), the level of private credit (Levine, Loayza, and Beck, 2000). All these variables are time-invariant across countries; it means that they have already been controlled by the country dummy variables.

4.5 Methodology

Concerned with the potential endogeneity problem, we use the following methodology to address the endogeneity problem.

4.5.1 Discussion about potential endogeneity problem

Vermaelen (1981) argues that share repurchase is regarded as a signal that the firm's stock price is underpriced. When a firm repurchases stocks in open market in a country, workers have more claims about wage and other benefits from when they observe the positive signal from the share repurchase. In order to gain more benefits from collective bargaining, workers turn to join labor unions. Consequently, the union membership increases in this country. This may lead to the reverse causality problem. From this perspective, more share repurchases in a country result in higher country-level union membership.

4.5.2 Instrumental variables

According to Hirsh (1980) and Hirsh (1982), the gender of the workers affects union membership. Scoville (1971) finds that the age of the workers also has effects union membership. There is no evidence that these two variables have effects on a firm's share repurchases directly. In the study of the relation between labor unions and firms' costs of equity. In Chen, Kacperczyk and Ortiz-Molina (2011), these two variables are used to deal with the endogeneity problems as the instrumental variables. Following this literature, these two country-level variables are used as the instruments in the two-stage least squares estimation (2SLS) applied in the empirical analysis. To our knowledge, neither gender nor age is directly used in studies relevant to corporate share repurchases in precious literature.

One instrumental variable is Fraction of Female Workers measuring the gender of the workers in a country. It is defined as the ratio of female workers to total workers in the country that a firm belongs to. The data of this variable is obtained from ILOStat database, which is maintained by the International Labor Organization.

The other instrumental variable is Average Age of the Workers measuring the average age of the workers in a country. It is defined as the mean of the age of all the workers in that country. This data also comes from ILOStat.

4.5.3 The validity of the instruments and the specification

To examine the validity of the instrumental variables and the specification, series tests are applied in the 2SLS estimations in this chapter.

Following the literature Stock, Wright and Yogo (2002) and Shea (1997), I conduct the F-test and partial R2 variables in the first-stage estimation to test whether the instrumental variables are relevant and have enough strength in the 2SLS estimation. Next, in the second stage, over-identifying restrictions test are applied to examine whether the instruments are exogenous. Following Hausman (1987), I conduct the Hausman test to whether there is a significant difference in the estimates between the coefficients of 2SLS estimation and coefficients of OLS estimation.

4.6 Results - Large Sample

Empirical results of large sample analysis are reported in this section.

This section starts with the univariate statistics and the OLS regressions on the determinants of share repurchases. Next, I report the results of the two-stage least squares (2SLS) estimation. Then, I show the results of sub-samples separated by Employment Protection Legislation and labor bargaining centralization. In addition, I conduct further analysis of the effects of labor unions on the relation between the share repurchases and firms' profitability and labor costs. Finally, I report the results of robustness checks.

4.6.1 Univariate statistics

Table 4-1 reports the univariate statistics. Panel A shows the univariate statistics of the variables. The mean and the median of the variable Repurchases is 0.0035 and 0.0000 while they are 0.0139 and 0.0007 for the variable Total Payout. The mean of the variable Union

Membership is 0.2548, and the median is 0.1860. Panel B shows the country-level Repurchases which is defined as the average of the share repurchases, and the country-level Total Payout, which is defined as the mean of dividends and share repurchases for all firms in their countries, as well as Union Membership.

Figure 4-1 illustrates the average share repurchases between 1992 and 2013 in 66 countries. Figure 4-2 shows the average total payout over the sample period in 66 countries. The deeper the colour in a country in the world maps indicates that share repurchases and total payout are higher in that country.

4.6.2 The determinants of share repurchases and the likelihood of share repurchases

Table 4-2 shows the results of determinants of share repurchases and the likelihood of share repurchases. Panel A reports the results of OLS regressions. It examines the relation between country-level union membership and share repurchases. We include the firm-level characteristics, year dummy variables, industry variables and country dummy variables as control variables. All results are clustered in the firm level, according to the literature (Fernandes and Gonenc, 2016). P-value is reported in the parentheses of the tables.

In Panel A, the coefficient Union Membership is 0.002 (p-value = 0.01) with the dependent variable is Share Repurchases in Column 1. Column 2 uses probit model to examine the likelihood of share repurchases. The variable Share Repurchases Likelihood is 1 for firms have share repurchases and is equal to 0 for firms doesn't have share repurchases. The coefficient Union Membership is 0.175 (p-value = 0.01) with the dependent variable is Share Repurchases Likelihood in Column 2. In Column 3, the coefficient of Union Membership is 0.002 (p-value = 0.01) in non-US firms with the dependent variable is Share repurchases.

In Panel B, the coefficient Union Membership is 0.002 (p-value = 0.01) with the dependent variable is Total Payout in Column 1. Column 2 uses tobit model to examine the likelihood of Total Payout. The variable Total Payout Likelihood is positive and continuous for

firms have total payout and is equal to 0 for firms doesn't have total payout. The coefficient Union Membership is 0.075 (p-value = 0.01) with the dependent variable is Total Payout Likelihood in Column 2. The significant results imply that firms have more share repurchases in countries with higher union membership. This is consistent with the Hypothesis 1A that the ratio of labor unions and the level of share repurchases are positively correlated. Therefore, firms strategically choose share repurchases to gain bargaining position when there is labor unions in this country.

4.6.3 Country-level regression

Table 4-3 shows the results of the relation between the country-level Union Membership and firms' share repurchases in that country. I replicate a country-level analysis in Table 4-2 by using country level variables. All country-level variables are converted from firm-level variables in Table 4-2 by using equally weighted financial data in each country. This sample contains 974 country-year observations in our country-level analysis.

The coefficient of Union Membership in Column 1 is 0.003 (p-value = 0.04) where the dependent variable is Country-level Share Repurchases. The coefficient of Union Membership in Column 2 is 0.012 (p-value = 0.04) where the dependent variable is Country-level Total Payout. The coefficient of Union Membership in Column 3 is 0.003 (p-value = 0.03) for Non-US firms where the dependent variable is Country-level Share Repurchases. It is consistent with the results of firm-level analysis in Table 4-2, indicating that there is a negative relation between the country-level Repurchases and country-level Union Membership. It is consistent with the Hypothesis 1A.

4.6.4. First-stage regression

Table 4-4 shows the first-stage regression of the 2SLS estimation. The independent variables contain two instrumental variables, year dummy variables, industry variables, country dummy variables and other control variables. The coefficient of the instrumental variable

Fraction of Female Workers is 1.537 (p-value = 0.01) and the coefficient of Average Age of the Workers is -0.006 (p-value = 0.01). The positive coefficient of Fraction of Female Workers indicates that male workers are less likely to join labor unions. This is consistent with the findings in Blanchflower (2006) by using international data from 34 countries. The negative coefficient of Average Age of the Workers indicates that older workers are less likely to join labor unions because they benefit from labor unions in a shorter time period than younger workers. It is consistent with the findings in Hirsch (1980).

4.6.5 Union membership and share repurchases

Table 4-5 shows the results of the second stage of 2SLS estimation. The dependent variable is Share Repurchases, while the independent variable is the predicted union membership and the same control variables in the first stage of 2SLS. In Column 1, the dependent viable is Share Repurchases. The coefficient of Union Membership is 0.041 (p-value = 0.01). The p-value of F-statistics in the over identification is 0.44, indicating that the instruments are exogenous and valid in this estimation. In the Hausman test, the p-value of the F-statistics is 0.01. This significant p-value indicates that the coefficient of 2SLS estimation is significantly different from the OLS estimation in Table 4-2. In Column 2, the dependent variable is Total Payout. The coefficient of Union Membership is 0.097 (p-value = 0.01). Therefore, the 2SLS estimation is a better method to deal with the endogeneity problem in this study. Column 3 shows the results of non-US firms, the coefficient of Union Membership is 0.042 (p-value = 0.01) with the dependent variable is Share Repurchases.

Comparing the results in Table 4-2 and Table 4-5, the economic magnitude of the 2SLS estimates explains how the variation of union membership affect the value of share repurchases is more economically significant than the results in OLS estimates. Table 4-1 shows the standard deviation of Union Membership is 0.2503 and the median of non-cash assets is 159.65 million dollars. A one standard deviation increase in Union Membership leads to a 0.010

increase (=0.041 * 0.2503) in the level of share repurchases and a 0.024 increase (=0.097 * 0.2503) in the level of total payout, corresponding to an increase in share repurchases with a dollar value of 1.600 million dollars (=0.010 * 159.65) and an increase in total payout with a dollar value of 3.876 million dollars (=0.024 * 159.65).

The results in Table 4-5 are consistent with Hypothesis 1A, indicating that the relation between labor unions and share repurchases is positive.

4.6.6 Employment protection legislation

Saint-Paul (2002) argues that higher level employment protection increases employees' bargaining power. I use the Employment Protection Legislation as the proxy of the protection of labor's rights and benefits across countries.

Similar with previous study about cash holdings and dividends, I obtain the data of Employment Protection Legislation (EPL) indicator from OECD. A higher lever EPL refers to better employment protection in a country. In accordance with the discussion in Hypothesis 2, better employment protection in a country increases the labor costs. It increases the operating leverage and firms reduce share repurchases to withstand the higher operating risks. These negative effects from labor unions on firms' share repurchases are opposite to the bargaining effects. This may offset some positive effects as predicted by bargaining hypothesis. Therefore, I expect that the positive effects of union membership on share repurchases are stronger for firms in a country with lower EPL and are weaker for firms in a country with higher EPL.

Table 4-6 shows the results of OLS estimates and the second stage of 2SLS estimations of share repurchases and total payout in two sub-groups in Panel A and Panel B, as well as the t-test of the difference in the coefficients in Panel C. These two sub-groups are constructed by separating firms in a country with higher (lower) level of employment protection when the EPL indicator of that country is higher (lower) than the median.

In Panel A, the coefficient of share repurchases in Column 1 is 0.053 (p-value =0.01) for the sub-group of firms in a country with lower level of employment protection. The coefficient of Union Membership in Column 2 is 0.004 (p-value =0.01) for the sub-groups of firms in a country with higher level employment protection. Column 3 and Column 4 show the results of the second stage of 2SLS estimations. In Column 3, the coefficient of Union Membership is 0.087 (p-value = 0.01) for the sub-group of firms in a country with lower level of employment protection. In Column 4, the coefficient of Union Membership is 0.003 (p-value = 0.07) for sub-group of firms in a country with higher employment protection. The insignificant F-statistics of over-identifying restrictions and the significant F-statistics of Houseman test show that the 2SLS estimations is proper than OLS regressions in this study. Results in Column 3 and 4 show that the bargaining effects are partially offset by the operating leverage and weaker the positive relation between labor unions and share repurchases for firms in a country with higher EPL.

Table 4-6 Panel B report the results of OLS regressions of total payout in Column 1 with coefficient is 0.155 (p-value = 0.01) and Column 2 with coefficients is 0.008 (p-value = 0.01) for the sub-groups of firms in a country with higher and lower level of employment protection separately. We find the difference is 0.147 (p-value = 0.01). For the second stage of 2SLS estimates, we have the coefficient of Union Membership is 0.312 (p-value = 0.01) for firms in a country with lower employment protection, and the coefficient of Union Membership is 0.007 (p-value = 0.01) for firms in a country with higher employment protection. The difference of the coefficients of Union Membership between the two sub-groups separated by the EPL indicator is 0.305 (p-value = 0.01).

In Panel C, the significant t-statistics reported indicates that the coefficients of Union Membership between the two sub-groups separated by EPL indicator are significantly different.

Therefore, results in Table 4-6 indicate that the positive relation between repurchases and union membership is stronger for firms in a country with a lower level of employment protection, and weaker for firms in a country with a higher level of employment protection. These results support both Hypothesis 1A and Hypothesis 2.

4.6.7 Labor bargaining centralization

Labor bargaining centralization also measures the collective bargaining power of workers. Similar with previous chapters, I get the data of labor bargaining centralization across 51 from the ICTWSS database. A higher level of Centralization means collective bargaining in a country has broader impacts and is more centrally coordinated in that country, indicating that the level of collective bargaining power is higher in that country. Therefore, as discussed in Hypothesis 1A, the expected positive relation between corporate payout and union membership is stronger for firms in a country with a higher level of Centralization, and weaker for firms in a country with a lower level of Centralization.

Table 4-7 shows the results of OLS and the second stage of 2SLS estimations of share repurchases divided in two sub-groups. In Panel A, we report the OLS regressions of in Column 1 and 2. These two sub-groups are constructed by separating firms in a country with higher (lower) level of collective bargaining power when the Centralization indicator of that country is higher (lower) than the median. The coefficient of Union Membership in Column 1 is 0.004 (p-value = 0.44) for the sub-group of firms in a country with lower level of labor bargaining centralization. The coefficient of Union membership in Column 2 is 0.061 (p-value = 0.01) for the sub-group of firms in a country with higher level of labor bargaining centralization. Column 3 and Column 4 show the results of the second stage of 2SLS estimations. In Column 3, the coefficient of Union Membership is 0.018 (p-value = 0.01) for the sub-group of firms in a country with lower level of labor bargaining centralization. In Column 4, the coefficient of Union Membership is 0.388 (p-value = 0.01) for sub-group of firms in a country with higher

labor bargaining centralization. The insignificant F-statistics of over-identifying restrictions and the significant F-statistics of Houseman test show that the 2SLS estimations is proper than OLS regressions in this study.

Table 4-7 Panel B reports the results of OLS regressions of total payout. In Column 1 coefficient of Union Membership is 0.061 (p-value = 0.01) and in Column 2, the coefficients is 0.302 (p-value = 0.01) for the sub-groups of firms in a country with higher and lower level of labor bargaining centralization separately. We find the difference is -0.368 (p-value = 0.01). For the second stage of 2SLS estimates, we have the coefficient of Union Membership is 0.217 (p-value = 0.01) for firms in a country with lower employment protection, and the coefficient of Union Membership is 0.585 (p-value = 0.01) for firms in a country with higher labor bargaining centralization. The difference of the coefficients of Union Membership between the two sub-groups separated by the EPL indicator is -0.368 (p-value = 0.01).

In Panel C Column 1, the difference of the two coefficients in Panel A Column 1 and Column 2 is significant with p-value =0.01. In Column 2, the difference of the two coefficients in Panel A Column 3 and Column 4 is 0.218. The significant t-statistics reported indicates that the coefficients of Union Membership between the two sub-groups separated by Centralization indicator are significantly different.

Therefore, results in Table 4-7 indicate that the positive relation between share repurchases and union membership is stronger for firms in a country with a higher level of Centralization, and is weaker for firms in a country with a lower level of Centralization. These results support Hypothesis 1A.

4.7 Results – Smaller Sample

To further understand the positive relation between union membership and payout in the large sample study, we conduct the analysis for a smaller sample of share repurchases and dividend change. We use the methodology of event study to examine this smaller sample. While

the large sample analysis examines the level of payout, the smaller sample analysis allows us to examine firm performance associated with the payout. Moreover, an additional benefit of conducting such an analysis is to reduce the endogeneity problem by studying how union membership affects the relation between the change in payout and the change in firm performance.

The international data of share repurchases are obtained from Thomason One database. The sample period is from 1992 to 2013, which is the same as the large sample analysis. I choose the repurchases whose Acquisition Techniques are recorded as "Open Market Purchase". I also require that the public status of the firm is "Public". After merging the sample of repurchases with the large sample and excluding the observations with incomplete data, the final sample contains 10338 repurchase events in 37 countries.[37]

4.7.1 Variables

This chapter use the same methods to calculate the announcement return and the Net Change in ROA around the events of share repurchases as the methods used in Chapter 3 about the event study of dividend changes.

4.7.2 Results about Share Repurchases Events

This section reports the results of the smaller sample analysis. First, I study the announcement return around share repurchases and report the results in Table 4-8. Next, I conduct the analysis on the change in operating performance around the events and report the results in Table 4-9.

4.7.2.1 Announcement return

Table 4-8 reports the regressions. The dependent variables are the announcement returns around the repurchases. Column 1 shows that the coefficient of Union Membership is 0.071

[37] Appendix 4-1 reports the univariate statistics of smaller sample.

(p-value=0.01) when the dependent variable is the cumulative abnormal returns over days (-1, +1) around the announcement date. It shows that the announcement return is positively correlated to Union Membership, implying that shareholders react more positively when the repurchase is made by a firm in a country with higher Union Membership. We find similar results in Column 2 and Column 3 when the dependent variable is the cumulative abnormal returns over days (-3, +3) and is over days (-5, +5) around the announcement date. The coefficient of Union Membership is 0.094 (p-value=0.08) for dependent variable is cumulative abnormal return over days (-3, +3), and the coefficient of Union Membership is 0.121 (p-value=0.01) for dependent variable is cumulative abnormal return over days (-5, +5) around the announcement date.

Our results in Table 4-8 indicate that the announcement return is higher when a firm have more share repurchases in a country with higher union membership. It implies that when a firm increase repurchases, it reduces the resources available for potential collective bargaining. Labor unions accept a lower level of wage in that there may be liquidity shortage, provided that bankruptcy is costly for employees, that leads to lower operating costs. This is more beneficial for shareholders because it is associated with positive market reaction with the announcement of repurchases. This is more prominent for the firms in a country with higher union membership. This is consistent with the bargaining hypothesis.

4.7.2.2 Change in operating performance

Table 4-9 reports the results of the change in operating performance around share repurchases. The dependent variable in Column 1 is the Change in ROA from year t-1 to year t+1. The coefficient of Union Membership is 0.076 (p-value = 0.06). It implies that there is a positive relation between Union Membership and the change in operating performance around the event of share repurchases. We get comparable firms based on the matching with size and M/B in the same industry (Column 2) and propensity score matching (Column 3). The

dependent variable in these two columns is the Net Change in ROA, which is defined as the difference between an event firm's change in ROA and its comparable firm's change in ROA from year t-1 to year t+1. The coefficient of Union Membership in Column 2 is 0.066 (p-value = 0.01), indicating that firms in countries with higher union membership have a higher net change in operating performance around the event of share repurchases. It implies that when firms make share repurchases, it reduces the resources available for potential collective bargaining. This strengthens a firm's bargaining positions and thus increases the firm's operating performance. This mechanism is more prominent for the firms in a country with higher union membership. Column 3 shows similar results. The coefficient of Union Membership is 0.128 (p-value = 0.02) when we use the propensity score matching method.

The results in Table 4-9 indicate that firms in countries with higher union membership have a higher net change in operating performance around the event of share repurchases. This is because more share repurchases reduce the resources available for potential collective bargaining. Labor unions accept a lower level of wage in that there may be liquidity shortage, provided that bankruptcy is costly for employees, that leads to lower operating costs. It is more beneficial for the operating performance of firms in a country with higher union membership. Our results are consistent with the bargaining hypothesis.

4.8 Further Analysis

This section describes the results in further analysis about the relation between share repurchases and labor unions.

4.8.1 Share repurchases and labor costs

As an effective bargaining tool, firms use share repurchases to distribute excess cash reserves to against wage demands of labor unions. In this case, a firm in a country with higher union membership is more likely to repurchase stocks to reduce the internal funds available for bargaining. Consequently, share repurchases decrease wage demands of workers. Therefore, I

expect that the negative relation between labor costs and share repurchases are stronger (weaker) for firms in a country with higher (lower) union membership.

Similar with Chapter 2 and Chapter 3, I use a sub-sample of 77380 firm-year observations and divide it into two sub-groups with union membership is higher or lower than the median

Table 4-10 shows the results of OLS regressions in Panel A. In terms of OLS regressions, the coefficient of Share Repurchases in Column 1 is −0.017 (p-value = 0.07) for the sub-group of firms with lower country-level union membership, while the coefficient of Share Repurchases in Column 2 is −0.440 (p-value = 0.01) for the sub-group of firms with higher country-level union membership. The negative coefficients imply that there is a negative relation between repurchases and labor costs. We conduct a t-test of the difference in the coefficients of Share Repurchases between the two sub-groups separated by union membership, and report the results in Panel B. We find that the difference is 0.423 (p-value = 0.01). The significant difference implies that the negative relation between repurchases and labor costs is significant weaker in countries with lower union membership.

The results in Table 4-10 imply that the negative relation between share repurchases and labor costs is stronger (weaker) for firms in a country with higher (lower) union membership. Similar with the results in Chapter 3, firms in a country with higher union membership repurchase more stocks to reduce the internal resources available for bargaining by labor unions. Firms can claim they are in liquidity shortage to lower wage demands of labor unions in that bankruptcy is also costly to employees. As a result, firms gain bargaining positions with higher repurchases and reduce the labor costs. The negative effects of share repurchases on labor costs are stronger in a country with higher union membership. The results are consistent with the Hypothesis 1A.

4.8.2 Share repurchases and strikes & lockouts

From the bargaining perspective, more share repurchases in a firm increase its bargaining power because there is less financial resource that can be extracted from labor unions through collective bargaining. Similar with discussion in 3.8.2, suppose a firm has lower share repurchases and more internal funds, labor unions tend to organize strikes to claim higher wages and other benefits in negotiations. Therefore, share repurchases have negative impacts on country-level strikes & lockouts.

The data of strikes & lockouts are collected from the International Labor Organization. The data starts from 2002 and includes 52 countries. The variable Log (Country-level Strikes & Lockouts + 1) is used as the proxy in this country-level analysis. The Country-level Strikes & Lockouts is defined as the total number of strikes and lockouts in a country. I add the variable of Log (Labor Force) as an additional control variable, while the Labor Force is defined as the sum of all persons of working age who are employed and those who are unemployed. Similar with the country-level analysis in Table 4-3, all firm-level variables are converted into country-level variables by taking the average of the variables across the countries.

Table 4-11 reports the results. I use the Log (Country-level Strikes & Lockouts + 1) as the dependent variable. The coefficient of the variable Country-level Repurchases is -5.088 (p-value = 0.07). This negative coefficient indicates that higher share repurchases reduce the intensity of strikes and lockouts in a country. The lower repurchases, the more financial resources that can be extracted by labor unions. Labor unions are more likely to organize more strikes to gain bargaining power in wage negotiations with firms. Therefore, the results in Table 4-11 are consistent with Hypothesis 1A, implying that more share repurchases reduce the strikes & lockouts organized by labor unions.

4.8.3 The Validity of Instrumental Variables

As discussed in Chapter 2 and Chapter 3, I test whether of instrumental variable is valid in this thesis by using the country-level data of gender gap which are collected from World Economic Forum. The average salary of female workers is lower than male workers. On one hand, the average lower level of salary for female workers means more female workers decrease firms' wage payments. Firms have more cash reserves and have the incentive to increase share repurchases due to the free cash flow problem. On the other hand, the positive coefficient of Fraction of Female Workers in Table 4-4 indicates that female workers are positive associated to union membership. This leads to a positive relation between share repurchases and union membership in that the gender pay gap.

Similar with 2.7.1, I divide the sample into two sub-groups based on the median of the variable Gender Gap. A firm is in a country with lower (higher) gender gap if the index is above (below) the median. The higher level of gender gap means that female and male are more equal in a country.

Table 4-12 reports the results of the second stage of 2SLS estimation brevity. Column 1 shows that the coefficient of Union Membership is 0.002 (p-value = 0.01), and Column 2 shows that such coefficient is 0.039 (p-value = 0.01). We conduct t-test and find that the difference is -0.037 (p-value = 0.33). The results imply that after controlling for the gender gap, firms in a country with higher union membership still have more repurchases in both sub-groups. Therefore, the findings are consistent with our bargaining hypothesis.

4.8.4 Collective bargaining coverage

Collective bargaining coverage rate measures the number of workers who are covered by labor unions but not the member. I use the collective bargaining coverage rate as an alternative measure for the bargaining power of labor unions to conduct this robustness check. Similar to the previous studies using this variable, I use the closest available data in the precedent year as

a proxy for the missing year of the variable. Collective Bargaining Coverage Rate is calculated as the percentage of workers who are covered by the collective bargaining agreements for all workers.

Table 4-13 shows the results. We use the replicate specifications in previous tables. In Panel A, Column 1 shows the results of OLS regression and Column 2 shows the results of the second stage of 2SLS estimates when the dependent variable is Share Repurchases. Column 3 and Column 4 shows the results of OLS regression and the second stage of 2SLS when the dependent variable is Total Payout. The coefficient of Collective Bargaining Coverage Rate is 0.003 (p-value = 0.01) in Column 1 and is 0.015 (p-value = 0.01) in Column 2. The coefficient of Collective Bargaining Coverage Rate is 0.036 (p-value = 0.01) in Column 3 and is 0.053 (p-value = 0.01) in Column 4. The results are similar with the previous tables that there is a positive relation between Collective Bargaining Coverage Rate and share repurchases. In the smaller sample analysis, I report the results in Panel B. I find the coefficient of the announcement return over days around the date of the event of share repurchases is 0.019 (p-value = 0.04) with the dependent variable is the cumulative abnormal returns over days (-1, +1) around the announcement date of share repurchases. Column 2 shows that the coefficient of Collective Bargaining Coverage Rate is 0.029 (p-value = 0.01) when the dependent variable is the cumulative abnormal returns over days (-3, +3) around the announcement date of share repurchases. Column 3 shows that the coefficient of Collective Bargaining Coverage Rate is 0.034 (p-value = 0.01) when the dependent variable is the cumulative abnormal returns over days (-5, +5) around the announcement date of share repurchases.

The results are consistent with the interpretation that there is positive relation between the announcement return around the event of share repurchases showed in previous tables. Therefore, we find similar results when we use collective bargaining coverage rate as alternative proxy for bargaining power of labor unions.

4.9 Conclusion

This chapter examines the effect of labor unions on share repurchases in the international setting. I use the country-level union membership as the measure of the bargaining power of labor unions across countries in the large sample analysis. In line with the bargaining perspective, I find in this chapter that the level of share repurchases is higher when a firm is in a country with stronger labor unions. I also find that the positive relation between labor unions and share repurchases is stronger when a firm is in a country with a higher degree of centralization for collective bargaining. Moreover, both the announcement returns and the net change in operating performance around the event of share repurchases are higher when a firm is in a country with stronger labor unions.

In addition, I find that the positive relation between share repurchases and labor costs is weaker for a firm in a country with lower union membership. I also find that the number of strikes & lockouts is lower in a country with a higher level of share repurchases. Moreover, I test the validity of instrument variables with gender gap and use the collective bargaining coverage rate as an alternative measure of bargaining power to conduct the robustness checks, and find consistent results.

While the empirical results generally support the bargaining hypothesis regarding the relation between labor unions and share repurchases, I also find some evidence that supports the operating leverage hypothesis. For example, when there is better employment protection legislation in a country, I find that it can offset a part of the bargaining impact of labor unions on the level of share repurchases because better employment protection is associated with a stronger operating effect for labor unions.

This chapter reinforces the notion of bargaining theory. I conclude that firms strategically choose corporate share repurchases as a bargaining tool to labor unions in the international setting.

Appendix 4-1 Univariate Statistics – Smaller Sample

This table shows univariate statistics of smaller sample analysis. We use a sample of 10338 share repurchases events from 37 countries between 1992 and 2013. CAR (-1, +1) is the cumulative abnormal return over days (-1, +1) around the announcement days. CAR (-3, +3) is the cumulative abnormal return over days (-3, +3) around the announcement days. CAR (-5, +5) is the cumulative abnormal return over days (-5, +5) around the announcement days. The cumulative abnormal return is calculated based on the market model. We use a firm's daily return and the return on its corresponding stock market index over days -200 to -20, where day 0 is the event date. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Runup* is defined as the annual stock return in the year prior to the announcement of the repurchases events.

Variable	Mean	Median	25th Percentile	75th Percentile	Standard Deviation
CAR (-1, +1)	0.022	0.015	-0.010	0.047	0.065
CAR (-3, +3)	0.022	0.016	-0.021	0.058	0.085
CAR (-5, +5)	0.020	0.015	-0.030	0.065	0.100
Union Membership	0.178	0.136	0.124	0.152	0.114
Size	20.136	19.982	18.513	21.634	2.058
Tobin's Q	1.939	1.550	1.160	2.239	1.300
Leverage	0.143	0.107	0.004	0.232	0.150
Capital Expenditures	0.060	0.043	0.023	0.075	0.059
Cash Flow	0.058	0.061	0.028	0.100	0.097
R&D	0.030	0.000	0.000	0.037	0.057
Working Capital	0.263	0.235	0.092	0.414	0.225
Industry Cash Flow Volatility	0.059	0.057	0.040	0.074	0.025
Runup	0.257	0.000	-0.035	0.051	2.107

Appendix 4-2 Propensity Score Matching - The Event of Repurchases

This table shows the logistic regression about the likelihood that a firm conducts share repurchases. We use a sample of 7289 share repurchases events from 29 countries between 1992 and 2013. The dependent variable is 1 if a repurchase takes place and is 0 otherwise. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Leverage* is defined as the ratio of long-term debts to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Sales Growth* is defined as the percentage change of sale over the previous year. *Tangibility* is defined as the ratio of the net Property, Plant and Equipment to assets. *Runup* is defined as the annual stock return over the previous year. The p–value is noted in the parentheses.

	Repurchase=1
Intercept	-10.782
	(0.01)
Size	0.295
	(0.01)
Tobin's Q	0.013
	(0.13)
Cash Flow	4.661
	(0.01)
R&D	4.067
	(0.01)
Capital Expenditure	3.014
	(0.01)
Industry Cash Flow Volatility	1.980
	(0.01)
Leverage	0.942
	(0.01)
Working Capital	1.678
	(0.01)
Sales Growth	0.031
	(0.07)
Tangibility	0.039
	(0.48)
Runup	-0.002
	(0.01)
Number of Observations	342799
Pseudo R-square	0.07

Table 4-1 Univariate Statistics

This table shows univariate statistics. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. Panel A reports univariate statistics. *Share Repurchases* is defined as the share repurchases to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Fraction of Female Workers* is defined as the fraction of female workers in the country a firm belongs to. *Average Age of the Workers* is the average age of the workers in the country a firm belongs to. *Employment Protection Legislation* is the OECD indicators of employment protection legislation that measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts in a country. *Centralization* is an indicator of the degree of labor bargaining centralization in a country from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database. Panel B reports dividends and union membership by countries. The mean of dividends, total payout and union membership in a country are reported in the panel.

Panel A. Univariate Statistics

Variable	Mean	Median	25th Percentile	75th Percentile	Standard Deviation
Share Repurchases	0.004	0.000	0.000	0.000	0.016
Total Payout	0.014	0.001	0.000	0.015	0.028
Union Membership	0.255	0.186	0.129	0.279	0.250
Size	19.239	19.080	17.894	20.409	1.873
Tobin's Q	1.713	1.244	0.958	1.849	1.456
Leverage	0.127	0.071	0.001	0.202	0.152
Capital Expenditures	0.057	0.037	0.017	0.069	0.066
Cash Flow	-0.012	0.027	-0.014	0.065	0.181
R&D	0.025	0.000	0.000	0.012	0.074
Working Capital	0.203	0.179	0.037	0.352	0.246
Industry Cash Flow Volatility	0.061	0.057	0.040	0.077	0.026
Fraction of Female Workers	0.439	0.454	0.419	0.464	0.038
Average Age of the Workers	39.718	39.557	38.335	40.962	2.133
Employment Protection Legislation	1.362	1.369	0.257	2.194	0.970

Panel B. Share Repurchases and Union Membership by Countries

Country	Share Repurchases	Total Payout	Union Membership	Country	Share Repurchases	Total Payout	Union Membership
Argentina	0.000	0.008	0.382	Malaysia	0.000	0.013	0.103
Australia	0.000	0.018	0.214	Malta	0.000	0.026	0.546
Austria	0.000	0.011	0.341	Mauritius	0.000	0.017	0.257
Belgium	0.001	0.010	0.543	Mexico	0.002	0.008	0.159
Brazil	0.000	0.015	0.253	Namibia	0.000	0.074	0.304
Bulgaria	0.000	0.002	0.166	Netherlands	0.003	0.019	0.217
Canada	0.004	0.014	0.288	New Zealand	0.001	0.021	0.217
Chile	0.000	0.007	0.144	Norway	0.000	0.013	0.544
China	0.000	0.007	0.459	Peru	0.000	0.009	0.042
Colombia	0.000	0.009	0.165	Philippines	0.000	0.009	0.145
Croatia	0.000	0.002	0.328	Poland	0.000	0.003	0.152
Cyprus	0.000	0.010	0.530	Portugal	0.000	0.006	0.215
Czech Republic	0.000	0.003	0.241	Russia	0.000	0.005	0.317
Denmark	0.001	0.016	0.710	Serbia	0.000	0.000	0.279
Egypt	0.000	0.009	0.275	Singapore	0.000	0.014	0.183
Estonia	0.000	0.022	0.092	Slovakia	0.000	0.003	0.256
Finland	0.001	0.027	0.726	Slovenia	0.000	0.007	0.319
France	0.001	0.006	0.079	South Africa	0.001	0.016	0.338
Germany	0.000	0.011	0.225	South Korea	0.000	0.006	0.104
Greece	0.001	0.010	0.243	Spain	0.001	0.013	0.167
Hungary	0.000	0.015	0.193	Sri Lanka	0.000	0.018	0.142
Iceland	0.001	0.004	0.835	Sweden	0.001	0.022	0.741
India	0.000	0.013	0.175	Switzerland	0.002	0.015	0.193
Indonesia	0.000	0.005	0.152	Tanzania	0.000	0.026	0.202
Ireland	0.006	0.017	0.369	Thailand	0.000	0.010	0.029
Israel	0.001	0.011	0.373	Trinidad and Tobago	0.000	0.021	0.210
Italy	0.000	0.008	0.350	Turkey	0.000	0.007	0.072
Japan	0.000	0.007	0.201	Ukraine	0.000	0.000	0.647
Kazakhstan	0.000	0.001	0.423	United Kingdom	0.002	0.022	0.294
Kuwait	0.000	0.028	0.023	United States	0.011	0.021	0.129
Latvia	0.000	0.006	0.164	Vietnam	0.000	0.003	0.146
Lithuania	0.000	0.010	0.108	Zambia	0.000	0.035	0.057
Luxembourg	0.002	0.011	0.385	Zimbabwe	0.000	0.009	0.075

Figure 4-1 Share Repurchases around the world

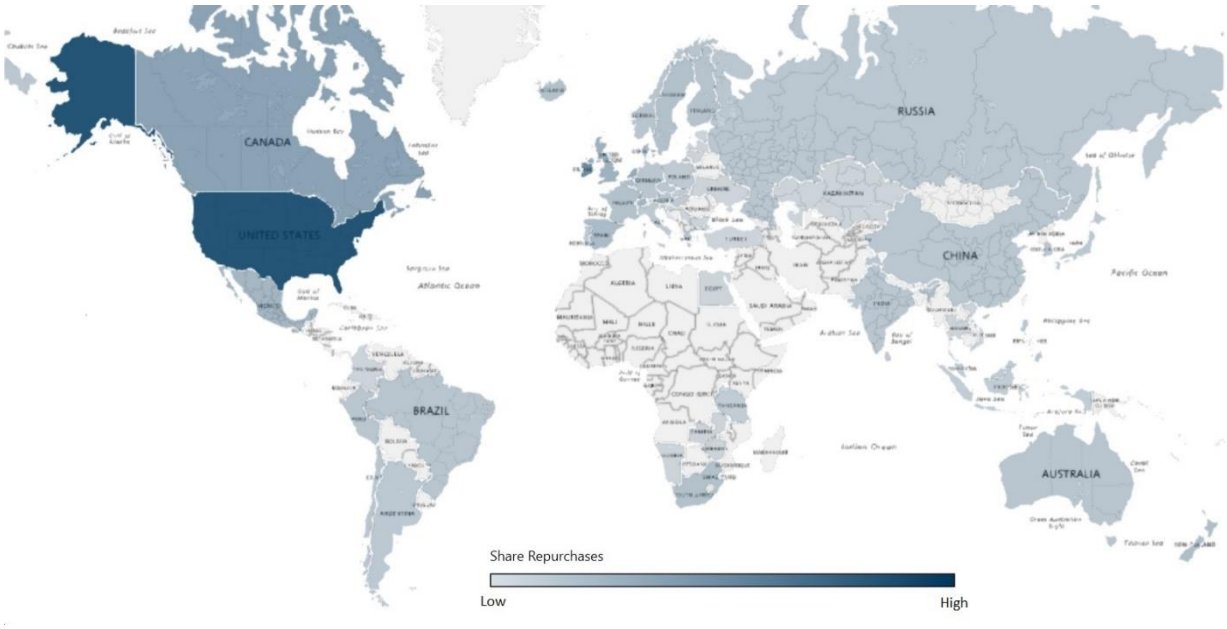

Figure 4-2 Total Payout around the world

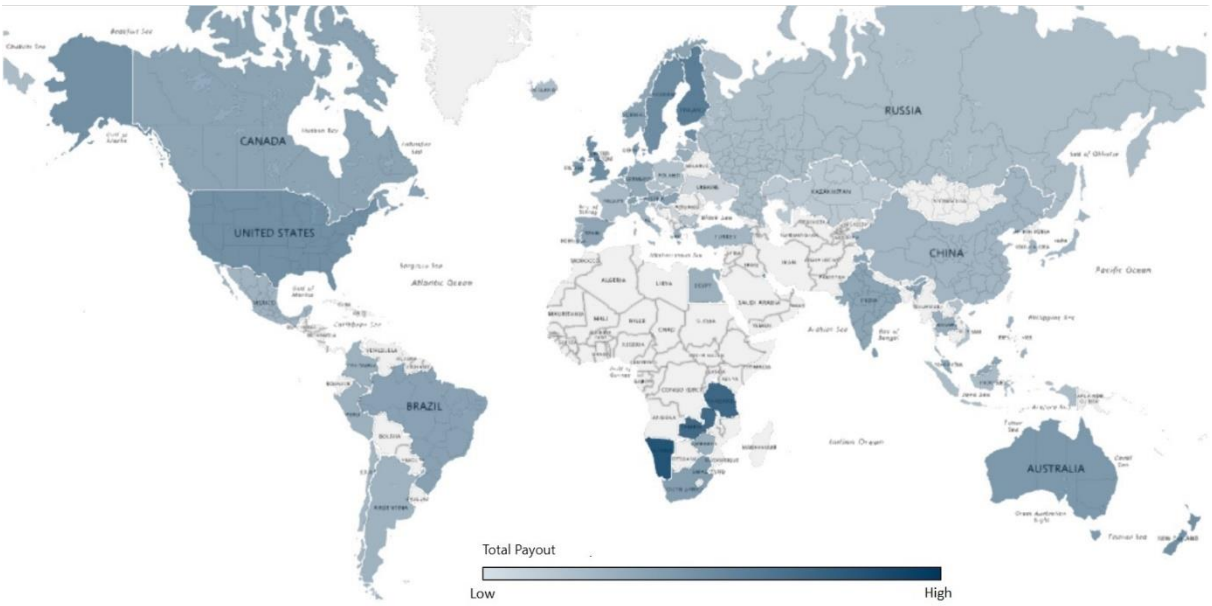

Table 4-2 Union Membership and Share Repurchases

This table shows an OLS regression about union membership and payout. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Share Repurchases* is defined as the ratio of share repurchases to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Repurchase Likelihood* is 1 if firms repurchase shares and is equal to 0 for firms doesn't repurchase shares. *Payout Likelihood* is positive and continuous for firms have total payout and is equal to 0 for firms doesn't have total payout. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

Panel A: the determinants of share repurchases and the likelihood of share repurchases

	Share Repurchases	Repurchase Likelihood	Share Repurchases
	Full sample	Full sample	Non-US firms
Intercept	-0.013	-4.745	-0.005
	(0.01)	(0.01)	(0.01)
Union Membership	0.002	0.175	0.002
	(0.01)	(0.01)	(0.01)
Size	0.001	0.185	0.001
	(0.01)	(0.01)	(0.01)
Tobin's Q	0.002	-0.042	0.001
	(0.01)	(0.01)	(0.01)
Leverage	-0.008	-0.539	-0.001
	(0.01)	(0.01)	(0.02)
Capital Expenditure	-0.001	0.014	-0.001
	(0.34)	(0.81)	(0.75)
Cash Flow	0.021	0.776	0.002
	(0.01)	(0.01)	(0.01)
R&D	0.006	-0.157	0.004
	(0.01)	(0.01)	(0.01)
Working Capital	0.002	0.206	0.001
	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.046	-2.690	-0.001
	(0.01)	(0.01)	(0.92)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	355715	355715	262326
Adjusted R-square	0.12	0.12	0.24

Panel B: the determinants of total payout and the likelihood of total payout

	Total Payout	Payout Likelihood
Intercept	-0.037	-0.136
	(0.01)	(0.01)
Union Membership	0.002	0.075
	(0.01)	(0.01)
Size	0.002	0.005
	(0.01)	(0.01)
Tobin's Q	0.003	0.003
	(0.01)	(0.01)
Leverage	-0.013	-0.021
	(0.01)	(0.01)
Capital Expenditure	-0.003	0.003
	(0.01)	(0.03)
Cash Flow	0.030	0.080
	(0.01)	(0.01)
R&D	0.006	0.021
	(0.01)	(0.01)
Working Capital	0.001	0.008
	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.052	-0.133
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	355715	355715
Adjusted R-square	0.15	0.15

Table 4-3 Union Membership and Payout: Country-level Analysis

This table shows an OLS regression on the country-level analysis about union membership, share repurchases and total payout. We convert all firm-level variables into country-level variables by taking the average of the variables across the countries. The sample includes 974 country-year observations between 1992 and 2013. *Share Repurchases* is defined as the ratio of share repurchases to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p-value is noted in the parentheses.

	Country-level Share Repurchases	Country-level Total Payout	Country-level Share Repurchases
	Full sample	Full sample	Non-US firms
Intercept	-0.004	0.009	0.001
	(0.47)	(0.65)	(0.85)
Union Membership	0.003	0.012	0.003
	(0.04)	(0.04)	(0.03)
Country-level Size	0.001	-0.001	0.001
	(0.06)	(0.10)	(0.26)
Country-level Tobin's Q	-0.001	-0.001	-0.001
	(0.33)	(0.05)	(0.39)
Country-level Leverage	-0.002	-0.033	-0.003
	(0.39)	(0.01)	(0.13)
Country-level Capital Expenditure	-0.002	-0.019	-0.001
	(0.61)	(0.22)	(0.88)
Country-level Cash Flow	-0.002	0.060	-0.001
	(0.40)	(0.01)	(0.71)
Country-level R&D	0.001	0.120	0.007
	(0.91)	(0.01)	(0.47)
Country-level Working Capital	0.003	0.006	0.004
	(0.13)	(0.30)	(0.02)
Country-level Cash Flow Volatility	-0.016	0.040	-0.002
	(0.53)	(0.66)	(0.95)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	974	974	952
Adjusted R-square	0.70	0.67	0.51

Table 4-4 Two-stage Least Square Estimation: First Stage

This table shows the first stage of two-stage least square estimation. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Fraction of Female Workers* is defined as the fraction of female workers in the country a firm belongs to. *Average Age of the Workers* is the average age of the workers in the country a firm belongs to. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	Union Membership
Intercept	-0.426
	(0.01)
Fraction of Female Workers	1.537
	(0.01)
Average Age of the Workers	-0.006
	(0.01)
Size	0.000
	(0.01)
Tobin's Q	-0.001
	(0.01)
Leverage	-0.008
	(0.01)
Capital Expenditure	-0.016
	(0.01)
Cash Flow	0.000
	(0.71)
R&D	0.009
	(0.01)
Working Capital	-0.013
	(0.01)
Industry Cash Flow Volatility	-0.183
	(0.01)
Year Dummy Variables	YES
Industry Dummy Variables	YES
Country Dummy Variables	YES
Number of Observations	355715
Adjusted R-square	0.89
Partial F-statistic (p-value)	0.01
Partial R-square	0.37

Table 4-5 Two-stage Least Square Estimation: Second Stage

This table shows the second stage of two-stage least square estimation. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. *Share Repurchases* is defined as the ratio of share repurchases to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	Share Repurchases	Total Payout	Share Repurchases
	Full sample	Full sample	Non-US firms
Intercept	-0.020	-0.048	-0.059
	(0.01)	(0.01)	(0.01)
Union Membership	0.041	0.097	0.049
	(0.01)	(0.01)	(0.01)
Size	0.001	0.002	0.003
	(0.01)	(0.01)	(0.01)
Tobin's Q	0.001	0.005	0.001
	(0.01)	(0.01)	(0.01)
Leverage	0.002	-0.016	0.002
	(0.01)	(0.01)	(0.10)
Capital Expenditure	0.000	-0.003	-0.003
	(0.32)	(0.01)	(0.15)
Cash Flow	0.001	0.026	0.010
	(0.01)	(0.01)	(0.01)
R&D	0.005	-0.021	0.049
	(0.01)	(0.01)	(0.01)
Working Capital	0.003	0.002	0.007
	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	0.001	-0.039	-0.015
	(0.46)	(0.01)	(0.36)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	355715	355715	262326
Adjusted R-square	0.05	0.16	0.18
Over-identifying Restrictions Test (p-value)	0.50	0.77	0.32
Hausman Test (p-value)	0.01	0.01	0.01

Table 4-6 Employment Protection Legislation

This table shows OLS regressions and the second-stage regressions of the 2SLS estimation for the sub-groups separated by the employment protection legislation. We use a sample of 281691 firm-year observations from 41 countries between 1992 and 2013. Panel A shows the regressions of *Share Repurchases*. Panel B shows the regressions of *Total Payout*. *Share Repurchases* is defined as the ratio of share repurchases to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Employment Protection Legislation* is the OECD indicators of employment protection legislation that measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts in a country. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses. Panel C shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions of Dividends

	Share Repurchases			
	OLS		The Second Stage of 2SLS	
	EPL < Median	EPL ≥ Median	EPL < Median	EPL ≥ Median
Intercept	-0.031	-0.009	-0.065	-0.007
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	0.053	0.004	0.087	0.003
	(0.01)	(0.01)	(0.01)	(0.07)
Size	0.002	0.001	0.002	0.000
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.001	0.001	0.001	0.001
	(0.01)	(0.59)	(0.01)	(0.94)
Leverage	-0.009	-0.003	-0.009	-0.003
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	-0.001	0.003	-0.001	0.003
	(0.11)	(0.24)	(0.16)	(0.25)
Cash Flow	0.012	0.004	0.012	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	0.002	0.003	0.002	0.004
	(0.01)	(0.40)	(0.01)	(0.17)
Working Capital	0.000	0.001	0.000	0.001
	(0.05)	(0.02)	(0.06)	(0.03)
Industry Cash Flow Volatility	-0.012	0.053	-0.012	0.051
	(0.03)	(0.01)	(0.03)	(0.01)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	158647	123044	158647	123044
Adjusted R-square	0.11	0.08	0.11	0.07
Over-identifying Restrictions Test (p-value)			0.34	0.36
Hausman Test (p-value)			0.01	0.01

Panel B. Regressions of Total Payout

	Total Payout			
	OLS		The Second Stage of 2SLS	
	EPL < Median	EPL ≥ Median	EPL < Median	EPL ≥ Median
Intercept	-0.048	-0.009	-0.145	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	0.155	0.008	0.312	0.007
	(0.01)	(0.01)	(0.01)	(0.01)
Size	0.003	0.001	0.003	0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.003	0.003	0.003	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.015	-0.013	-0.015	-0.008
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	-0.011	0.001	-0.010	0.001
	(0.01)	(0.60)	(0.01)	(0.42)
Cash Flow	0.022	0.042	0.022	0.041
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	0.001	0.004	0.001	0.020
	(0.89)	(0.01)	(0.89)	(0.01)
Working Capital	-0.005	0.004	-0.005	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.049	-0.029	-0.044	-0.034
	(0.01)	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	158647	123044	158647	123044
Adjusted R-square	0.12	0.08	0.12	0.06
Over-identifying Restrictions Test (p-value)			0.32	0.28
Hausman Test (p-value)			0.01	0.01

Panel C. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by EPL and reports the p-value of the t-test in the parentheses.

	Union Membership			
	Share Repurchases		Total Payout	
	OLS	Second Stage of 2SLS Estimation	OLS	Second Stage of 2SLS Estimation
Difference	0.049	0.084	0.147	0.305
(p-value)	(0.01)	(0.01)	(0.01)	(0.01)

Table 4-7 Labor Bargaining Centralization

This table shows OLS regressions and the second-stage regressions of the 2SLS estimation for the sub-groups separated by the labor bargaining centralization. We use a sample of 253238 firm-year observations from 32 countries between 1992 and 2013. Panel A shows the regressions of *Share Repurchases*. Panel B shows the regressions of *Total Payout*. *Share Repurchases* is defined as the ratio of share repurchases to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Centralization* is an indicator of the degree of labor bargaining centralization in a country from the Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) database. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses. Panel C shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions of Dividends

	Share Repurchases			
	OLS		The Second Stage of 2SLS	
	Centralization < Median	Centralization ≥ Median	Centralization < Median	Centralization ≥ Median
Intercept	-0.027	-0.036	-0.012	-0.051
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	0.004	0.061	0.018	0.388
	(0.44)	(0.01)	(0.02)	(0.01)
Size	0.001	0.002	0.001	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.001	0.001	0.001	0.001
	(0.14)	(0.01)	(0.12)	(0.01)
Leverage	-0.008	-0.010	-0.001	-0.010
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	-0.004	-0.004	0.001	-0.003
	(0.26)	(0.01)	(0.41)	(0.01)
Cash Flow	0.015	0.014	0.001	0.014
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	0.005	0.004	0.001	0.004
	(0.28)	(0.01)	(0.33)	(0.01)
Working Capital	0.006	-0.001	0.001	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	0.059	-0.022	0.007	-0.022
	(0.01)	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	126099	127139	126099	127139
Adjusted R-square	0.04	0.11	0.04	0.11
Over-identifying Restrictions Test (p-value)			0.95	0.71
Hausman Test (p-value)			0.01	0.01

Panel B. Regressions of Total Payout

	Total Payout			
	OLS		The Second Stage of 2SLS	
	Centralization < Median	Centralization ≥ Median	Centralization < Median	Centralization ≥ Median
Intercept	-0.042	-0.067	-0.115	-0.193
	(0.01)	(0.01)	(0.01)	(0.01)
Union Membership	0.061	0.302	0.217	0.585
	(0.01)	(0.01)	(0.01)	(0.01)
Size	0.001	0.003	0.001	0.003
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.003	0.003	0.003	0.003
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.012	-0.016	-0.012	-0.015
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	-0.008	-0.006	-0.006	-0.006
	(0.01)	(0.01)	(0.01)	(0.01)
Cash Flow	0.037	0.022	0.036	0.022
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	-0.002	0.001	-0.003	0.001
	(0.12)	(0.95)	(0.05)	(0.93)
Working Capital	0.004	-0.007	0.005	-0.007
	(0.01)	(0.01)	(0.01)	(0.01)
Industry Cash Flow Volatility	-0.057	-0.028	-0.040	-0.029
	(0.01)	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	126099	127139	126099	127139
Adjusted R-square	0.20	0.12	0.20	0.12
Over-identifying Restrictions Test (p-value)			0.35	0.94
Hausman Test (p-value)			0.01	0.01

Panel C. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by Centralization and reports the p-value of the t-test in the parentheses.

	Union Membership			
	Dividends		Total Payout	
	OLS	Second Stage of 2SLS Estimation	OLS	Second Stage of 2SLS Estimation
Difference	-0.057	-0.370	-0.241	-0.368
(p-value)	(0.01)	(0.01)	(0.01)	(0.01)

Table 4-8 Announcement Return: Repurchases

This table shows the regressions about the announcement return of repurchases. We use a sample of 10338 share repurchases events from 37 countries between 1992 and 2013. CAR (-1, +1) is the cumulative abnormal return over days (-1, +1) around the announcement days. CAR (-3, +3) is the cumulative abnormal return over days (-3, +3) around the announcement days. CAR (-5, +5) is the cumulative abnormal return over days (-5, +5) around the announcement days. The cumulative abnormal return is calculated based on the market model. We use a firm's daily return and the return on its corresponding stock market index over days -200 to -20, where day 0 is the event date. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Runup* is defined as the annual stock return in the year prior to the announcement of the repurchases events. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	CAR (-1, +1)	CAR (-3, +3)	CAR (-5, +5)
Intercept	0.017	-0.015	-0.031
	(0.40)	(0.57)	(0.31)
Union Membership	0.071	0.094	0.121
	(0.01)	(0.01)	(0.01)
Size	-0.001	-0.001	0.001
	(0.03)	(0.16)	(0.48)
Tobin's Q	-0.001	-0.001	0.001
	(0.31)	(0.48)	(0.78)
Leverage	0.016	0.006	0.016
	(0.01)	(0.43)	(0.07)
Capital Expenditure	0.028	0.033	0.035
	(0.05)	(0.08)	(0.11)
Cash Flow	0.001	-0.008	-0.016
	(0.99)	(0.44)	(0.18)
R&D	-0.001	-0.035	-0.031
	(0.94)	(0.10)	(0.22)
Working Capital	0.004	0.001	0.005
	(0.24)	(0.87)	(0.38)
Industry Cash Flow Volatility	0.157	0.121	0.114
	(0.03)	(0.21)	(0.32)
Runup	0.001	0.001	0.001
	(0.06)	(0.12)	(0.51)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	10338	10338	10338
Adjusted R-square	0.03	0.02	0.02

Table 4-9 Change in Operating Performance: Repurchases

This table shows the regressions about the change in operating performance around share repurchases. We use a sample of 10338 share repurchases events from 37 countries between 1992 and 2013. ΔROA is the change in ROA from year t-1 to year t+1, where ROA is defined as the ratio of EBIT to assets. ΔNet ROA is defined as the difference between an event firm's change in ROA and its matched comparable firm's change in ROA from year t-1 to year t+1. We get comparable firms based on the matching with size and M/B in the same industry (Column 2) and propensity score matching (Column 3). *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p–value is noted in the parentheses.

	ΔROA	ΔNet ROA	
		Industry, Size and M/B Matching	Propensity Score Matching
Intercept	-0.104	0.017	-0.214
	(0.01)	(0.63)	(0.01)
Union Membership	0.076	0.066	0.128
	(0.06)	(0.01)	(0.02)
Size	0.004	-0.001	0.008
	(0.01)	(0.57)	(0.01)
Tobin's Q	0.001	0.011	0.004
	(0.72)	(0.01)	(0.01)
Leverage	0.021	0.014	0.020
	(0.01)	(0.36)	(0.09)
Capital Expenditure	-0.049	0.002	-0.027
	(0.01)	(0.97)	(0.37)
R&D	-0.096	-0.017	-0.086
	(0.01)	(0.69)	(0.01)
Working Capital	-0.027	-0.015	-0.003
	(0.01)	(0.14)	(0.74)
Industry Cash Flow Volatility	0.093	-0.424	0.257
	(0.29)	(0.04)	(0.09)
ROA t-1	-0.306	-0.357	-0.354
	(0.01)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	9633	9633	9780
Adjusted R-square	0.16	0.02	0.07

Table 4-10 Share Repurchases and Labor Costs

This table shows OLS regressions about share repurchases and labor costs for the sub-groups separated by union membership. We use a sample of 77380 firm-year observations from 63 countries between 1992 and 2013. Panel A shows the regressions. *Log (Average Labor Costs)* is defined as the logarithm of average labor costs, where average labor costs are the ratio of staff expenses to the number of employees. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Share Repurchases* is defined as the ratio of share repurchases to assets. *Size* is defined as the logarithm of market value of assets. *Leverage* is defined as the ratio of long-term debts to market value of assets. *Average Sales per Employee* is the ratio of sales to the number of employees. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Tangibility* is the ratio of plant, property and equipment to assets. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Corporate Cash Holdings between the two sub-groups.

Panel A. Regressions

	Log (Average Labor Costs)	
	Union Membership < Median	Union Membership ≥ Median
Intercept	7.971	7.820
	(0.01)	(0.01)
Share Repurchases	-0.017	-0.440
	(0.07)	(0.01)
Size	0.008	-0.009
	(0.01)	(0.01)
Leverage	-0.046	0.226
	(0.08)	(0.01)
Average Sales per Employee	0.339	0.459
	(0.01)	(0.01)
Tobin's Q	0.005	0.045
	(0.09)	(0.01)
Tangibility	-0.197	-0.345
	(0.01)	(0.01)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	38981	38399
Adjusted R-square	0.65	0.40

Panel B. Difference in the Coefficients of Share Repurchases

The following table shows the difference in the coefficients of Share Repurchases between the two sub-groups separated by union membership and reports the p-value of the t-test in the parentheses.

	Share Repurchases
Difference	0.423
(p-value)	(0.01)

Table 4-11 Corporate Payout and Strikes & Lockouts: Country-level Analysis

This table shows an OLS regression on the country-level analysis about Share repurchases, Total Payout and Strikes & Lockouts. We convert all firm-level variables into country-level variables by taking the average of the variables across the countries. The sample includes 781 country-year observations between 1992 and 2013 from 52 countries. *Strikes & Lockouts* are defined as the total number of strikes and lockouts in a country. *Share Repurchases* is defined as the ratio of share repurchases to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Labor Force* is defined as the sum of all persons of working age who are employed and those who are unemployed. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of working capital and marketable securities to assets. *Cash flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The p-value is noted in the parentheses.

	Log (Country-level Strikes & Lockouts + 1)	Log (Country-level Strikes & Lockouts + 1)
Intercept	-15.776	-31.232
	(0.01)	(0.01)
Country-level Share Repurchases	-5.088	
	(0.07)	
Country-level Total Payout		-10.732
		(0.02)
Log (Country-level Labor Force)	0.796	1.539
	(0.01)	(0.01)
Country-level Size	0.175	0.158
	(0.03)	(0.11)
Country-level Tobin's Q	0.041	-0.107
	(0.56)	(0.10)
Country-level Leverage	0.608	-1.932
	(0.58)	(0.13)
Country-level Capital Expenditure	-5.567	-1.514
	(0.01)	(0.51)
Country-level Cash Flow	-0.049	2.372
	(0.97)	(0.08)
Country-level R&D	9.326	7.520
	(0.09)	(0.19)
Country-level Working Capital	-0.014	-0.383
	(0.99)	(0.67)
Country-level Cash Flow Volatility	5.399	-4.290
	(0.67)	(0.74)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	781	781
Adjusted R-square	0.89	0.88

Table 4-12 Robustness Check: Gender Gap

This table shows the second-stage regressions of the 2SLS estimation for the sub-groups separated by the Gender Gap. We use a sample of 355715 firm-year observations from 66 countries between 1992 and 2013. Panel A shows the regressions. *Gender Gap* index is from the World Economic Forum and is constructed based on the equality between women and men across four key areas: health, education, economy and politics (see text for details). *Share Repurchase* is defined as the ratio of share repurchases to assets. *Union Membership* is defined as the ratio of the total number of trade union members to the total number of paid employees in a country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. The standard errors are clustered at the firm level. The p–value is noted in the parentheses. Panel B shows the difference in the coefficients of Union Membership between the two sub-groups.

Panel A. Regressions

	Share Repurchases	
	Second Stage of 2SLS	
	Gender Gap < Median	Gender Gap≥ Median
Intercept	-0.008	-0.045
	(0.01)	(0.01)
Union Membership	0.002	0.039
	(0.01)	(0.01)
Size	0.001	0.002
	(0.01)	(0.01)
Tobin's Q	0.001	0.001
	(0.01)	(0.01)
Leverage	0.001	-0.008
	(0.01)	(0.01)
Capital Expenditure	-0.002	-0.001
	(0.01)	(0.24)
Cash Flow	0.002	0.010
	(0.01)	(0.01)
R&D	0.017	0.001
	(0.01)	(0.11)
Working Capital	0.001	0.001
	(0.01)	(0.18)
Industry Cash Flow Volatility	-0.001	-0.009
	(0.84)	(0.04)
Year Dummy Variables	YES	YES
Industry Dummy Variables	YES	YES
Country Dummy Variables	YES	YES
Number of Observations	239191	116524
Adjusted R-square	0.17	0.12
Over-identifying Restrictions Test (p-value)	0.26	0.41
Hausman Test (p-value)	0.01	0.01

Panel B. Difference in the Coefficients of Union Membership

The following table shows the difference in the coefficients of Union Membership between the two sub-groups separated by Gender Gap and reports the p-value of the t-test in the parentheses.

	Union Membership Second Stage of 2SLS Estimation
Difference	-0.037
(p-value)	(0.33)

Table 4-13 Robustness Check: Collective Bargaining Coverage Rate

This table shows the robustness check by using Bargaining Coverage Rate as an alternative measure of bargaining power. We use a sample of 326262 firm-year observations from 55 countries between 2000 and 2013. In Panel A, we report the OLS regression and the second stage of two-stage least square estimation. *Dividend*s is defined as the ratio of dividends to assets. *Total Payout* is defined as the ratio of the sum of dividends and share repurchases to assets. *Collective Bargaining Coverage Rate* is calculated as the number of employees whose pay and/or conditions of employment are determined by one or more collective agreement(s) in a country divided by the total number of employees in that country. *Size* is defined as natural logarithm of assets. *Tobin's Q* is defined as market value of equity plus assets minus book value of equity, divided by assets. *Leverage* is defined as the ratio of long-term debts to assets. *Capital Expenditures* is defined as the ratio of capital expenditures to assets. *Cash Flow* is defined as income after interest, and taxes, but before depreciation and provisions for common and/or preferred dividends, divided by assets. *R&D* is defined as the ratio of research and development expenses to assets. *Working Capital* is defined as the ratio of current assets minus current to assets. *Industry Cash Flow Volatility* is defined as the standard deviation of the median of *Cash Flow* in an industry classified by two-digit SIC codes in the prior 5 years. *Cash* is defined as the ratio of cash and marketable securities to assets. *Year Dummy Variables* are the dummy variables for the years in the sample and not reported in the table. *Industry Dummy Variables* are the dummy variables for the industries defined by two-digit SIC codes and not reported in the table. *Country Dummy Variables* are the dummy variables for the countries in the sample and not reported in the table. Panel B report the regressions about the announcement return around the event of dividend increases and dividend decreases. The p-value is noted in the parentheses. The p-value is noted in the parentheses.

Panel A. Collective Bargaining Coverage Rate, Share Repurchases and Total Payout

	Share Repurchases		Total Payout	
	OLS	The Second Stage of 2SLS	OLS	The Second Stage of 2SLS
Intercept	-0.028	-0.031	-0.040	-0.031
	(0.01)	(0.01)	(0.01)	(0.01)
Collective Bargaining Coverage Rate	0.003	0.015	0.036	0.053
	(0.01)	(0.01)	(0.01)	(0.01)
Size	0.001	0.001	0.002	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Tobin's Q	0.001	0.001	0.003	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.006	-0.006	-0.015	-0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Capital Expenditure	-0.002	-0.002	-0.001	0.002
	(0.01)	(0.01)	(0.40)	(0.01)
Cash Flow	0.009	0.010	0.029	0.026
	(0.01)	(0.01)	(0.01)	(0.01)
R&D	0.000	0.001	0.010	0.028
	(0.45)	(0.14)	(0.01)	(0.01)
Working Capital	0.000	-0.001	0.001	0.006
	(0.04)	(0.01)	(0.40)	(0.01)
Industry Cash Flow Volatility	-0.005	-0.003	-0.074	-0.066
	(0.09)	(0.28)	(0.01)	(0.01)
Year Dummy Variables	YES	YES	YES	YES
Industry Dummy Variables	YES	YES	YES	YES
Country Dummy Variables	YES	YES	YES	YES
Number of Observations	326262	326262	326262	326262
Adjusted R-square	0.12	0.12	0.14	0.10
Over-identifying Restrictions Test		0.38		0.64
Hausman Test		0.01		0.01

Panel B. Collective Bargaining Coverage Rate and Announcement Return

	Repurchases		
	CAR (-1, +1)	CAR (-3, +3)	CAR (-5, +5)
Intercept	0.017	-0.021	-0.028
	(0.40)	(0.42)	(0.36)
Collective Bargaining Coverage Rate	0.019	0.029	0.034
	(0.04)	(0.01)	(0.01)
Size	-0.001	-0.001	0.001
	(0.03)	(0.28)	(0.67)
Tobin's Q	0.001	0.001	0.001
	(0.85)	(0.92)	(1.00)
Leverage	0.018	0.010	0.019
	(0.01)	(0.19)	(0.03)
Capital Expenditure	0.030	0.036	0.047
	(0.05)	(0.07)	(0.04)
Cash Flow	-0.008	-0.022	-0.027
	(0.34)	(0.05)	(0.04)
R&D	-0.012	-0.052	-0.042
	(0.45)	(0.02)	(0.10)
Working Capital	0.005	0.005	0.009
	(0.21)	(0.37)	(0.17)
Industry Cash Flow Volatility	0.176	0.171	0.118
	(0.02)	(0.08)	(0.30)
Runup	0.005	0.001	0.003
	(0.33)	(0.92)	(0.72)
Year Dummy Variables	YES	YES	YES
Industry Dummy Variables	YES	YES	YES
Country Dummy Variables	YES	YES	YES
Number of Observations	9383	9383	9383
Adjusted R-square	0.03	0.02	0.02

Chapter 5 Conclusion

5.1 Summary of the Findings

This thesis examines the effects of labor unions on corporate financial policies, including corporate cash holdings, dividends and share repurchases across 66 countries from 1992 to 2013. This thesis aims to extend to which labor unions play a role in these three financial policies. My results corroborate some findings reported in previous literature about bargaining hypothesis.

In Chapter 2, we developed two hypotheses based on the bargaining perspective and operating leverage perspective. Consistent with Klasa, Maxwell and Ortiz-Molina (2009), Chapter 2 shows that there is a negative relation between labor unions and corporate cash holdings across countries. We therefore suggest that firms strategically reduce corporate cash holdings to gain bargaining positions when there are strong labor unions in a country.

In Chapter 3, we study the relation between labor unions and dividends. Different from Chino (2015), we find that dividends are positively related to country-level union membership based on the bargaining mechanism. In addition, we find the market response and operating performance changes to the event of dividend increase (decrease) with the presence of labor unions are positive (negative).

In Chapter 4, I examine how country-level labor unions affect share repurchases. When there is higher union membership in a country, firms tend to repurchase more shares. Moreover, I find the announcement return is higher for firms in a country with higher union membership around the announcement date of share repurchases, while the net ROA change is positively correlated with the union membership around the event date of share repurchases.

Therefore, this thesis studies how labor unions affect firms' financial policies across countries by providing more comprehensive evidence based on a more complete distribution

of union membership around the world. Our results show that the firms strategically use corporate cash holdings, dividends and share repurchases to gain bargaining power in collective bargaining with labor unions in international setting.

5.2 Limitations

5.2.1 The country-level data

This thesis uses the data of country-level union membership from the International Labor Organization as the proxy of bargaining power of employees across countries because only the country-level data are available from the International Labor Organization. Compared with firm-level data, country-level data are less accurate because they are the aggregate at the country level. However, most papers use industry-level data when they conduct large sample analysis for US companies, such as Klasa, Maxwell and Ortiz-Molina (2009), Chino (2016) and so on. Similar to them, this thesis is not unique to use more aggregate data instead of firm-level data.

5.2.2 Database coverage

Since our sample period is from 1992 to 2013, the coverage of Compustat Global database changes during this period. It implies that for some countries, Compustat Global has better coverage so that the data are mostly complete throughout the sample period. However, for some other counties, they were not covered in Compustat Global until the late 2000s. Given the existence in the difference among the coverage for different countries, in our analysis, the countries with more complete data will be assigned more weighting while the countries with less complete data will be assigned less weighting. A possible way to mitigate this limitation is that, as time goes, the coverage in Compustat may increase. There will be more complete data in the future, and one may conduct further robustness checks with an extended period of data.

5.2.3 The measure of bargaining power

We use the variable Union Membership as the measure of bargaining power, however, it may not be a good measurement. On one hand, union density has been found very low in some countries (e.g. France), but the bargaining power of workers in these countries are not low. Because collective agreements negotiated by labor unions also cover workers who are not union members. (Olson, 1965, and Calmfors et al., 2001). We also consider the bargaining coverage rate as another measure in our robustness checks and find it is also a good measurement of bargaining power in countries with available data. On the other hand, as a country-level variable, union density is affected by cross-country differences, including the different definitions, different data sources and different reporting techniques across countries. In addition, there are also some employer-dominated unions and the existences of self-employed people, makes union density less valid in measuring bargaining power (Bean and Holden, 1994).

5.2.4 Instrumental approach

In this thesis, we use age and female as two instrumental variables to mitigate the endogeneity problems. However, there are possible limitations to the instrumental approach. For example, these instruments may be correlated to the country-level characteristics. Although we have conducted some analysis to address this issue, such as examining the gender gap, we may not exhaust all the possibilities of country-level characteristics.

5.2.5 The attrition of observations about labor costs

The variable Average Labor Costs are the ratio of staff expenses to the number of employees. Since the staff expenses, employee numbers are not required to report, there are a lot of firms that have missing value of these data items across countries. These missing observations reduce the number of firm-year observations from 355,715 to 77,380 and reduce the number of countries from 66 to 63. The missing countries are Egypt (59 firm-year observations in original sample), Namibia (1 firm-year observations in original sample) and

Tanzania (2 firm-year observations in original sample). Although this subgroup analysis is still efficient to reflect how labor unions affect the relation between labor costs and corporate cash holdings, dividends as well as share repurchases. The attrition of observations may lead to loss of effectiveness in estimations with a small sample.

5.2.6 The methodology about strikes & lockouts

In the current analysis, we demonstrate how corporate cash holdings, dividends and share repurchases are related to the number of strikes & lockouts in a country. However, an alternative way to conduct more detailed analysis is to conduct some event studies. For example, suppose there is a coming strikes & lockouts event, we may study how firms react to this coming event by making adjustments of corporate cash holdings, dividends and share repurchases. Due to the availability of the data, this thesis has not conducted the event studies about strikes & lockouts.

5.3 Future research direction

This thesis enlightens some promising areas for future research.

First, there are several alternative bargaining mechanisms such as EPL, labor bargaining centralization. As discussed in the previous study, both EPL and labor bargaining centralization increase the bargaining power of workers (e.g., Saint-Paul, 2002, Simintzi, Vig and Volpin, 2015). For example, further study about EPL will provide us with a promising extension on the literature of bargaining hypothesis of corporate finance from the perspective of labor law.

Secondly, labor unions also impact firms' other financial policies. This thesis shows that firms strategically take several measures, including lowering the corporate cash holdings, increasing dividend payments and conduct share repurchases, to reduce the internal financial resources when there are strong labor unions. There are also other financial policies that can be used to lower firms' internal funds, such as mergers and acquisitions, increasing investments

and so on. It will be interesting to explore how labor unions affect other corporate financial policies from the bargaining perspective.

Thirdly, given the limitation of country-level data of labor unions, one extension is to study the bargaining power of labor unions with industry-level data or firm-level data from other data sources if they are available in future. Most paper study the relation of labor unions on corporate financial policies with the industry-level data in the US (e.g., Klasa, Maxwell and Ortiz-Molina, 2009). When there are industry-level data or firm-level data of labor unions in other data sources, further study using these data will provide comparable results to existed US researches.

References

Abowd, J., 1989. The effect of wage bargains on the stock market value of the firm. The American Economic Review 79, 774-800.

Acharya, V., Lambrecht, B., 2012. A theory of income smoothing when insiders know more than outsiders. Review of Financial Studies 28. 10.2139.

Addessi, W., Busato, F., 2009. Fair wages, labor relations and asset returns. Journal of Financial Stability 5, 410–430.

Agrawal, A., 2012. Corporate governance objectives of labor union shareholders: Evidence from proxy voting. Review of Financial Studies 25, 187-226.

Allen, F., Bernardo, A., Welch, I., 2000. A theory of dividends based on tax clienteles. The Journal of Finance 55, 2499-2536.

Allen, F., Michaely, R., 2003. Payout policy, handbook of the economics of finance,in: G.M. constantinides & M. Harris & R. M. Stulz (ed.), Handbook of the Economics of Finance, Elsevier 1, 337-429.

Allen, S., 1984. Trade unions, absenteeism, and exit-voice. Industrial and Labor Relations Review 37, 331-345.

Alli, K., Khan, A., Ramirez, G., 1993. Determinants of corporate dividend policy: A factorial analysis. Financial Review 28, 523-547.

Almeida, H., Campello, M., Weisbach, M., 2004. The cash flow sensitivity of cash. The Journal of Finance 59, 1777-1804.

Almeida, H., Fos, V., Kronlund, M., 2016. The real effects of share repurchases. Journal of Financial Economics 119, 168-185.

Alzahrani, M., Lasfer, M., 2012. Investor protection, taxation, and dividends. Journal of Corporate Finance, Elsevier 18, 745-762.

Atanassov, J., Kim, E., 2009. Labor and corporate governance: International evidence from restructuring decisions. Journal of Finance 64, 341-374.

Bagwell, L., 1991. Share repurchase and takeover deterrence. The RAND Journal of Economics 22, 72-88.

Bagwell, L., Shoven, J., 1989. Cash distributions to shareholders. Journal of Economic Perspectives 3, 129-40.

Baker, M., Stein, J., Wurgler, J., 2003. When does the market matter? stock prices and the investment of equity-dependent firms. *The Quarterly Journal of Economics* 118, 969–1005.

Baldwin, C., 1983. Productivity and labor unions: An application of the theory of self-enforcing contracts. Journal of Business, 155-185.

Bartov, E., 1991. Open-market stock repurchases as signals for earnings and risk changes. Journal of Accounting and Economics 14, 275-294.

Bates, T., 2005. Asset sales, investment opportunities, and the use of proceeds. Journal of Finance 60, 105–135.

Bates, T., Kahle, K., Stulz, R., 2009. Why do U.S. firms hold so much more cash than they used to? Journal of Finance 64, 1985-2021.

Baumol, W., 1952. The transactions demand for cash: An inventory theoretic approach. The Quarterly Journal of Economics 66, 545-556.

Bean, R., Holden, K., 1994. "Determinants of trade union membership in OECD countries: A survey", International Journal of Manpower 15, 4-35.

Benartzi, S., Michaely, R., Thaler, R., 1997. Do changes in dividends signal the future or the past?. The Journal of Finance 52, 1007-1034.

Bhattacharya, S., 1979. Imperfect information, dividend policy, and "The bird in the hand" fallacy. Bell Journal of Economics 10, 259-270.

Black, F., 1976. The dividend puzzle. Journal of Portfolio Management 2, 5–84.

Blanchflower, D., 2006. A cross-country study of union membership. Working paper, Dartmouth College.

Borisov, A., Gupta, N., Subramanian, K., 2013. Employment protection laws and cross-border mergers and acquisitions. Working paper, Indiana University.

Bornhall, A., Daunfeldt, S., Rudholm, N., 2017. Employment protection legislation and firm growth: evidence from a natural experiment. Industrial and Corporate Change 26, 169–185.

Botero, J., Djankov, S., La Porta, R., Lopez-de-Silanes, F., and Shleifer, A., 2004. The Regulation of Labor ,Quarterly Journal of Economics 119, 1339-1382.

Brav, A., Graham, J., Harvey, C., Michaely, R., 2005. Payout policy in the 21st century. Journal of Financial Economics 77, 483-527.

Brickley, J., 1983. Shareholder wealth, information signaling and the specially designated dividend: An empirical study. Journal of Financial Economics, 12,187-209.

Bronars, S., Deere, D., 1991. The threat of unionization, the use of debt, and the preservation of shareholder wealth. Quarterly Journal of Economics 106, 231–254.

Bronars, S., Deere, D., 1993. Unionization, incomplete contracting, and capital investment. The Journal of Business, University of Chicago Press, 66, 117-132.

Calmfors, L., Booth, A., Checchi, D., Naylor, R., and Visser, J., 2001. 'Part I: The Future of Collective Bargaining in Europe', in T. Boeri, A. Brugiavini and L. Calmfors (eds), The Role of Unions in the Twenty-First Century. A Report to the Fondazione Rodolfo Debenedetti (Oxford, Oxford University Press) 1–139.

Campello, M., Gao, J., Qiu, J., Zhang, Y., 2018. Bankruptcy and the cost of organized labor: Evidence from union elections. The Review of Financial Studies 31, 980–1013.

Campello, M., Graham, J., Harvey, C., 2010. The real effects of financial constraints: Evidence from a financial crisis. Journal of Financial Economics 97, 470-487.

Cartter, A., 1959. Theory of wages and employment, Homewood.

Chan, K., Ikenberry, D., Lee, I., Wang, Y., 2009. Share repurchases as a potential tool to mislead investors. Journal of Corporate Finance 16, 2010.

Chay, J., Suh, J., 2009. Payout policy and cash-flow uncertainty. Journal of Financial Economics 93, 88-107.

Chemmanur, T., Cheng, Y., Zhang, T. 2013. Human capital, capital structure, and employee pay: An empirical analysis. Journal of Financial Economics 110, 478-502.

Chen, I., Chen, Y., Chen, S., 2018. The strategic choice of payment method in corporate acquisitions: The role of collective bargaining against unionized workers. Journal of Banking & Finance, Elsevier 88, 408-422.

Chen, S., Chen, Y., Wang, Y., 2015. Does labor power affect the likelihood of a share repurchase?. Financial Management 44, 623-653.

Chen, Y., Dou, Y., Rhee, G., Truong, C., Veeraraghavan, M., 2015. National culture and corporate cash holdings around the world. Journal of Banking and Finance 50, 2015.

Chen, H., Kacperczyk, M., Ortiz-Molina, H., 2011. Labor unions, operating flexibility, and the cost of equity. Journal of Financial and Quantitative Analysis 46, 25–58.

Clark, L., 1980. Ethics and problems of the 21st century. Philosophical Books 21, 237-239.

Clark, P., Sadler, J., 2016. "The codetermination bargains: the history of German corporate and labour law" in Free, R. (eds) 21st Century Economics: A Reference Handbook. SAGE Publications, Inc, 163-172.

Chino, A., 2016. Do labor unions affect firm payout policy? Operating leverage and rent extraction effects. Journal of Corporate Finance 41: 156-178.

Choi, D., Chen, S., 1997. The differential information conveyed by share repurchase tender offers and dividend increases. Journal of Financial Research 20, 529-543.

Chun, H., Shin, S., 2018. The impact of labor union influence on corporate social responsibility. Sustainability 10, 1922.

Comment, R., Jarrell, G., 1991. The relative signaling power of dutch-auction and fixed-price self-tender offers and open-market share repurchases. The Journal of Finance 46, 1243-1271.

Connolly, R., Hirsch, B., Hirschey, M., 1986. Union rent seeking, intangible capital, and market value of the firm. The Review of Economics and Statistics 68, 567-577.

Cornell, B., Shapiro, A., 1987. Corporate stakeholders and corporate finance. Financial Management 16, 5-14.

Dann, L., 1981. Common stock repurchases: An analysis of returns to bondholders and stockholders. Journal of Financial Economics 9, 113-138.

Dann, L., Masulis, R., Mayers, D., 1991. Repurchase tender offers and earnings information. Journal of Accounting and Economics 14, 217-251.

Danthine, J., Donaldson, J., 2002. Labour relations and asset returns. Review of Economic Studies, 69, 41–64.

Dasgupta, S., Sengupta, K., 1993. Sunk investment, bargaining and choice of capital structure. International Economic Review, 203-220.

Dawson, M., 2015. The legal and political accountability structure of 'Post-Crisis' EU economic governance. J Common Mark Stud 53, 976–993.

DeAngelo, H., DeAngelo, L., 1990. Dividend policy and financial distress: An empirical investigation of troubled NYSE firms. The Journal of Finance 45, 1415-1431.

DeAngelo, H., DeAngelo, L., 1991. Union negotiations and corporate policy: A study of labor concessions in the domestic steel industry during the 1980s. Journal of Financial Economics 30, 3–43.

DeAngelo, H., DeAngelo, L., Skinner, D., 1996. Reversal of fortune Dividend signaling and the disappearance of sustained earnings growth. Journal of Financial Economics 40, 341-371.

DeAngelo, H., DeAngelo, L., and Skinner, D., 2008. Corporate Payout Policy. Foundations and Trends in Finance 3, 2-3.

Deery, S., 1990. Productivity, organisational change and the management of employee relations. Asia Pacific Journal of Human Resources 28, 5-16.

Deloof, M., 2001. Belgian intragroup relations and the determinants of corporate liquid reserves. European Financial Management 7, 375-392.

Dewenter, K., Warther, V., 1998. Dividends, asymmetric information, and agency conflicts: evidence from a comparison of the dividend policies of Japanese and U.S. firms. The Journal of Finance 53, 879-904.

Djankov, S., La Porta, L., Lopez-de-Silanes, and Shleifer, A., 2002. The Regulation of Entry.

Quarterly Journal of Economics 1, 1–37.

D'Mello, R., Krishnaswami, S., Larkin, P., 2008. Determinants of corporate cash holdings: Evidence from spin-offs. Journal of Banking & Finance, Elsevier 32, 1209-1220.

Dittmar, A., Mahrt-Smith, J., 2007. Corporate governance and the value of cash holdings. Journal of Financial Economics 83, 599–634.

Dittmar, A., Mahrt-Smith, J., Servaes, H., 2003. International corporate governance and corporate cash holdings. Journal of Financial and Quantitative Analysis 38, 111-133.

Drobetz, W., Grüninger, M., Hirschvogl, S., 2010. Information asymmetry and the value of cash. Journal of Banking & Finance, Elsevier, 34, 2168-2184.

D'Souza, J., Jacob, J., Ramesh, K., 2001. The use of accounting flexibility to reduce labor renegotiation costs and manage earnings. Journal of Accounting and Economics 30, 187–208.

Dudley, E., Zhang, N., 2016. Trust and corporate cash holdings. Journal of Corporate Finance, Elsevier 41, 363-387.

Dunsby, A., 1994. Share repurchases, dividends, and corporate distribution policy. University of Pennsylvania.

Easterbrook, F., 1984. Two agency-cost explanations of dividends. The American Economic Review 74, 650-659.

Eije, H., Megginson, W., 2008. Dividends and share repurchases in the European Union. Journal of Financial Economics 89, 347-374.

Ellwood, D., Fine, G., 1987. The impact of right-to-work laws on union organizing. Journal of Political Economy 95, 250-73.

Evans, J., Evans, R., Gentry, J., 2003. The decision to repurchase shares: A cash flow story. Journal of Business and Management 9, 99-123.

Faleye, O., Mehrotra, V., & Morck, R., 2006. When labor has a voice in corporate governance. Journal of financial and quantitative analysis 41, 489-510.

Fallick, B., Hassett, K., 1999. Investment and union certification. Journal of Labor Economics 17, 570-582

Fama, E., & Babiak, H., 1968. Dividend policy: An empirical analysis. Journal of the American Statistical Association 63, 1132-1161.

Fama, E., French, K., 1998. Taxes, financing decisions, and firm value. Journal of Finance 53, 819-843.

Fama, E., French, K., 2000. Forecasting profitability and earnings. The Journal of Business 73, 161-175.

Fama, E., French, K., 2001. Disappearing dividends: changing firm characteristics or lower propensity to pay?, Journal of Financial Economics 60, 3-43.

Fama, E., French, K., 2002. Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies* 15, 1–33.

Faulkender, M., Wang, R., 2006. Corporate financial policy and the value of cash. The Journal of Finance 61, 1957-1990.

Fazzari, S., Glenn, H., Bruce, P., 1988. Financing constraints and corporate investment. Brookings Papers on Economic Activity 19, 141-206

Fellner, W., 1947. Prices and wages under bilateral monopoly, The Quarterly Journal of Economics 61, 503–532.

Fenn, G., Liang, N., 2001. Corporate payout policy and managerial stock incentives. Journal of Financial Economics 60, 45-72.

Fernandes, N., Gonenc, H., 2016. Multinationals and cash holdings. Journal of Corporate Finance 39, 139-154.

Ferreira, M., and Vilela, A., 2004. Why do firms hold cash? evidence from EMU countries. European Financial Management 10, 295-319.

Floyd, E., Li, N., Skinner, D., 2015. Payout policy through the financial crisis: The growth of repurchases and the resilience of dividends. Journal of Financial Economics 118, 299-316.

Freeman, R., 1986. The effect of the union wage differential on management opposition and union organizing success. The American Economic Review 76(2), 92-96.

Fresard, L., 2010. Financial strength and product market behavior: The real effects of corporate cash holdings. Journal of Finance 65, 1097-1122.

Gao, H., Harford, J., Li, Kai., 2013. Determinants of corporate cash policy: Insights from private firms. Journal of Financial Economics, Elsevier 109, 623-639.

Garvey, G., Gaston, N., 1997. A theory of the optimal cost barrier to corporate takeovers. International Economic Review 38, 657-675.

Gaspar, J., Massa, M., Matos, P., Patgiri, R., Rehman, Z., 2004. Can buybacks be a product of shorter shareholder horizons?. CEPR Discussion Paper No. 4813.

Ghaly, M., Dang, V., Stathopoulos, K., 2017. Cash holdings and labor heterogeneity: The role of skilled labor. The Review of Financial Studies 30, 3636–3668.

Ghaly, M., Dang, V., Stathopoulos, K., 2015. Cash holdings and employee welfare. Journal of Corporate Finance 33, 53-70.

Gomez, R., Tzioumis, K., 2006. What do unions do to executive compensation? (No.

CEPDP0720). Centre for Economic Performance, London School of Economics and Political Science.

Gordon, M., 1959. Dividends, earnings, and stock prices. The Review of Economics and Statistics, 99-105.

Gould, W., 2004. A primer on American labor law. Cambridge: MIT Press, 2.

Greene, W.H., 1997, Econometric analysis, Prentice Hall.

Griffin, P., Ning, Z., 2009. Accounting rules? Stock buybacks and stock options: Additional evidence. UC Davis Graduate School of Management Research Paper 08-09.

Grinstein, Y., Michaely, R., 2005. Institutional holdings and payout policy. The Journal of Finance 60, 1389-1426.

Grullon, G., Michaely, R., 2002. Dividends, share repurchases, and the substitution hypothesis. The Journal of Finance 57, 1649-1684.

Grullon, G., and Michaely, R., 2004. The information content of share repurchase programs. The Journal of Finance 59, 651-680.

Grullon, G., Michaely, R., Benartzi, S., Thaler, H., 2005. Dividend changes do not signal changes in future profitability. The Journal of Business, University of Chicago Press 78, 1659-1682.

Grullon, G., Michaely, R., Swaminathan, B., 2002. Are dividend changes a sign of firm maturity?. The Journal of Business 75, 387-424.

Gu, T., 2017. U.S. multinationals and cash holdings. Journal of Financial Economics 125, 344-368.

Guay, W., Harford, J., 2000. The cash-flow permanence and information content of dividend increases versus repurchases. Journal of Financial Economics 57, 385-415.

Hadlock, C., Pierce, J., 2010. New evidence on measuring financial constraints: Moving beyond the KZ index. The Review of Financial Studies 23, 1909–1940.

Hall, M., 1994. “Industrial relations and the social dimension of European integration” in Hyman R and Ferner A (eds) New Frontiers in European Industrial Relations, Oxford: Blackwell, 281-311.

Hanka, G., 1998. Debt and the terms of employment. Journal of Financial Economics 48, 245–282.

Harford, J., 1999. Corporate cash reserves and acquisitions. Journal of Finance 54, 1969-1997.

Harford, J., Mansi, S., Maxwell, W., 2008. Corporate governance and firm cash holdings in the US. Journal of Financial Economics, Elsevier 87, 535-555.

Hausman, J.A., 1978. Specification tests in econometrics. Econometrica 46, 1251–1271.

Hausman, J., Ruud, P., 1987. Specifying and testing econometric models for rank-ordered data. Journal of Econometrics 34, 83-104.

He, J., Tian, X., Yang, H., 2015. Labor unions and payout policy: A regression discontinuity analysis. Working Paper, University of Georgia.

Healy, P., Palepu, K., 1988. Earnings information conveyed by dividend initiations and omissions. Journal of Financial Economics 21, 149-175.

Healy, P., Palepu, K., 1988. Earnings information conveyed by dividend initiations and omissions, Journal of Financial Economics 21, 149-175.

Hirsch, B., 1980. The determinants of unionization: An analysis of interarea differences. Industrial and Labor Relations Review 33, 147-161.

Hirsch, B., 1982. The interindustry structure of unionism, earnings, and earnings dispersion. Industrial and Labor Relations Review 36, 22–39.

Hirsch, B., Link, A., 1987. Labor union effects on innovative activity. Journal of Labor Research 8, 323–332

Hirsch, B., 1991. Union coverage and profitability among U.S. firms. The Review of Economics and Statistics 73, 69-77.

Hoberg, G., Prabhala, N., 2009. Disappearing dividends, catering, and risk. The Review of Financial Studies 22,79-116.

Howe, K., He, J., Kao, G., 1992. One-time cash flow announcements and free cash-flow theory: Share repurchases and special dividends. The Journal of Finance 47, 1963-1975.

Ikenberry, D., Lakonishok, J., Vermaelen, T., 2000. Stock repurchases in Canada: Performance and strategic trading. Journal of Finance 55, 2373-2397.

Ippolito, R., 1985. The economic function of underfunded pension plans. Journal of Law and Economics 28, 611-51.

Itzkowitz, J., 2013. Customers and cash: How relationships affect suppliers cash holdings. Journal of Corporate Finance 19, 159-180.

Jagannathan, M., Stephens, C., Weisbach, M., 2000. Financial flexibility and the choice between dividends and stock repurchases. Journal of Financial Economics 57, 355-384.

Jagannathan, M., Stephens, C., 2003. Motives for multiple open-market repurchase programs. Financial Management 32, 2.

Jensen, M., 1986. Agency costs of free cash flow, corporate finance, and takeovers. The American Economic Review 76, 323-329.

Jensen, M., Meckling, W., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3, 305-360.

John, K., Knyazeva, A., Knyazeva, D., 2015. Employee rights and acquisitions. Journal of Financial Economics 118, 49-69.

JOHN, K., WILLIAMS, J., 1985. Dividends, dilution, and taxes: A signaling equilibrium. The Journal of Finance 40, 1053-1070.

Jolls, C., 1996. Hands-tying and the age discrimination in employment act. Faculty Scholarship Series. 1390.

Kaestner, R., Liu, F., 1998. New evidence on the information content of dividend announcements. The Quarterly Review of Economics and Finance 38, 251-274.

Kahl, M., Lunn, J., Nilsson, M., 2014. Operating leverage and corporate financial policies. Working Paper, University of Texas at Austin.

Kalcheva, I., Lins, K., 2007. International evidence on cash holdings and expected agency problems. Review of Financial Studies 20, 1087-1112.

Kaplan, S., Zingales, L., 1997. Do investment-cash flow sensitivities provide useful measures of financing constraints?. The Quarterly Journal of Economics 112, 169–215.

Keynes, J., 1937. The general theory of employment. The Quarterly Journal of Economics 51, 209-223.

Kim, C., Mauer, D., Sherman, A., 1998. The determinants of corporate liquidity: Theory and evidence. The Journal of Financial and Quantitative Analysis 33, 335-359.

Klasa, S., Maxwell, W., Ortiz-Molina, H., 2009. The strategic use of corporate cash holdings in collective bargaining with labor unions. Journal of Financial Economics 92, 421-442.

Koch, A., Sun, A., 2004. Dividend changes and the persistence of past earnings changes. The Journal of Finance 59, 2093-2116.

Lambrecht, B., Myers, S., 2012. A lintner model of payout and managerial rents. The Journal of Finance 67, 1761-1810.

Lambrecht, B., Myers, S., 2017. The dynamics of investment, payout and debt. The Review of Financial Studies 30, 3759–3800.

Lang, L., Litzenberger, R., 1989.Dividend announcements: Cash flow signaling vs. free cash flow hypothesis?. Journal of Financial Economics 24, 181-191.

La Porta, R., Lopez-de-Silanes, E., Shleifer, A., Vishny, R., 1997. Legal determinants of external finance. Journal of Finance 52, 1131-1150.

La Porta, R., Lopez-de-Silanes, E., Shleifer, A., Vishny, R., 2000. Agency problems and dividend policies around the world. The Journal of Finance 55, 1-33.

Leary, M., Michaely, R., 2011. Determinants of dividend smoothing: Empirical evidence. The Review of Financial Studies 24, 3197–3249.

Lee, D., Mas, A., 2012. Long-run impacts of unions on firms: new evidence from financial markets, 1961-1999. Quarterly Journal of Economics 127, 333-378.

Lee, B., Suh, J., 2011. Cash holdings and share repurchases: International evidence.
Journal of Corporate Finance 17, 1306-1329.

Leontief, W., (1946). Wages, profit and prices. The Quarterly Journal of Economics 61, 26–39.

Leung, W., Li, O., & Rui, O., 2010. Labor union and accounting conservatism. Working paper.

Levine, R., Loayza, N., Beck, T., 2000. Financial intermediation and growth: Causality and causes. Journal of Monetary Economics 46, 31-77.

Lewis, H., 1986. Chapter 20 union relative wage effects. Handbook of Labor Economics 2,1139-1181.

Liberty, S., Zimmerman, J., 1986. Labor union contract negotiations and accounting choices. The Accounting Review 61, 692-712.

Lie, D., Colamarino, S., Song, H., Désiré, L., Mira, H., Consiglio, A., Lein, E., Jessberger, S., Lansford, H., Dearie, A., & Gage, F., 2005. Wnt signaling regulates adult hippocampal neurogenesis. Nature 437, 1370-1375.

Lins, K., Servaes, H., Tufano, P., 2010. What drives corporate liquidity? An international survey of cash holdings and lines of credit. Journal of Financial Economics 98, 160-176.

Lintner, J., 1956. Distribution of incomes of corporations among dividends, retained earnings, and taxes. The American Economic Review 46, 97-113.

Liu, H., Swanson, E., 2016. Is price support for overvalued equity a motive for increasing share repurchases?. Journal of Corporate Finance 38, 77-91.

Lloyd, W., Jahera, J., Page, D., 1985. Agency costs and diviedend payout ratios. Financial Review 20, 78-78.

Manconi, A., Peyer, U., Vermaelen, T., 2018. Are buybacks good for long-term shareholder value? Evidence from buybacks around the world. European Corporate Governance Institute (ECGI) – Finance. Working Paper. Bocconi University.

Marciukaityte, D., 2015. Right-to-work laws and financial leverage. Financial Management 44, 147-175.

Marciukaityte, D., 2018. Labor laws and firm performance. The Journal of Financial Research 41, 5-32.

Matsa, D., 2006. The impact of financial incentives on firm behavior. Ph.D. thesis, Department of Economics, MIT.

Matsa, D., 2010. Capital structure as a strategic variable: Evidence from collective bargaining. Journal of Finance 65, 1197-1232.

Mauer, D., Triantis, A., 1994. Interactions of corporate financing and investment decisions: A dynamic framework. The Journal of Finance 49, 1253-1277.

McGaughey, E., 2016. The codetermination bargains: the history of German corporate and labour law. Columbia Journal of European Law, 23.

McLaughlin, D., Fraser, D., 1984. Collective bargaining: The next twenty years. The Annals of the American Academy of Political and Social Science 473, 33-39.

Mefford, R., 1986. The effect of unions on productivity in a multinational manufacturing firm. Industrial and Labor Relations Review 40, 105-114.

Mensa, Joan., Michaely, R., Schmalz, M., 2014. Payout Policy. Ross School of Business Paper No. 1227.

Michaely, R., Roberts, M., 2012. Corporate dividend policies: lessons from private firms. The Review of Financial Studies 25, 711–746

Michaely, R., Thaler, R., Womack, K., 1995. Price reactions to dividend initiations and omissions: Overreaction or drift?. Journal of Finance 50, 573-608.

Mikkelson, W., Partch, M., 2003. Do persistent large cash reserves hinder performance? Journal of Financial and Quantitative Analysis 38, 275-294.

Miller, M., Modigliani, F., 1961. Dividend policy, growth, and the valuation of shares. The Journal of Business, University of Chicago Press 34, 411-411.

Miller, M., and Scholes, M., 1978. Dividends and taxes. Journal of Financial Economics, 6, 333-364.

Miller, M., Orr, D., 1966. A model of the demand for money by firms. The Quarterly Journal of Economics 80, Pages 413–435.

Miller, M., Rock, K., 1985. Dividend policy under asymmetric information. The Journal of Finance 40, 1031-1051.

Myers, S., Majluf, N., 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13, 187-221,

Myers, B., Saretto, A., 2015. Does capital structure affect the behavior of nonfinancial stakeholders? An empirical investigation into leverage and union strikes. Management Science 62, 3235-3253.

Nikolov, B., Whited, T., 2014. Agency conflicts and cash: Estimates from a dynamic model.

The Journal of Finance 69, 1883-1921.

Nissim, D., Ziv, A., 2001. Dividend changes and future profitability. The Journal of Finance 56, 2111-2133.

Nohel, T., Vefa, T., 1998. Share repurchases and firm performance: new evidence on the agency costs of free cash flow, Journal of Financial Economics 49, 187-222

Ofer, A., Thakor, A., 1987. A theory of stock price responses to alternative corporate cash disbursement methods: Stock repurchases and dividends. The Journal of Finance 42, 365-394.

Olson, M., 1965. The Logic of Collective Action: Public Goods and the Theory of Groups, 2nd edn. (Cambridge, MA, Harvard University)

Opler, T., Pinkowitz, L., Stulz, R., Williamson, R., 1999. The determinants and implications of corporate cash holdings. Journal of Financial Economics 52, 3-46.

Opler, T., Titman, S., 1994. Financial distress and corporate performance. The Journal of Finance 49, 1015-1040.

Oswald, A., 1982. Trade unions, wages and unemployment: What can simple models tell us? Oxford Economic Papers 34, 526-45.

Oswald, D., Young, S., 2004. What role taxes and regulation? A second look at open market share buyback activity in the UK. Journal of Business Finance & Accounting 31, 257-292.

Oswald, D., Young, S., 2008. Share reacquisitions, surplus cash, and agency problems. J. Bank. Finan 32, 795-806.

Ozkan, A., Ozkan, N., 2004. Corporate cash holdings: An empirical investigation of UK companies. Journal of Banking & Finance 28, 2103-2134.

Padgett, C., Wang, Z., 2007. Short-term returns of UK share buyback activity. ICMA Centre Discussion Papers in Finance. Henley Business School, Reading University

Pagano, M., Volpin, P., 2005. The political economy of corporate governance. American Economic Review 95, 1005-1030.

Perfect, S., Peterson, D., Peterson, P., 1995. Self-tender offers: The effects of free cash flow, cash flow signaling, and the measurement of Tobin's q. Journal of Banking & Finance 19, 1005-1023

Perotti, E., Spier, K., 1993. Capital structure as a bargaining tool: The role of leverage in contract renegotiation. The American Economic Review 1131-1141.

Pettit, J., 2001. Is a share buyback right for your company? Harvard Business Review 79, 141.

Pinkowitz, L., Stulz, R., Williamson, R., 2005. Does the contribution of corporate cash holdings and dividends to firm value depend on governance? A cross-country analysis.

Pinkowitz, L., Stulz, R., Williamson, R., 2013. Is there a US high cash holdings puzzle after the financial crisis? Working Paper, Ohio State University.

Pinkowitz, L., Williamson, R., 2007. What is the market value of a dollar of corporate cash? Journal of Applied Corporate Finance 19, 74-81.

Qiu, Y., Shen, T., 2017. Organized labor and loan pricing: A regression discontinuity design analysis. Journal of Corporate Finance 43, 407-428.

Ramirez V., 2004. Dividend signaling and unions, MPRA Paper 2273, University Library of Munich.

Rao, R., White, S., 1994. The dividend payouts of private firms: evidence from tax court decisions. Journal of Financial Research 17, 449-464.

Rosett, J., 2003. Labour leverage, equity risk and corporate policy choice. European Accounting Review 12(4), 699-732.

Rozeff, M., 1982. Growth, beta and agency costs as determinants of dividend payout ratios. Journal of Financial Research 5, 249-259.

Ruback, R., Zimmerman, M., 1984. Unionization and profitability: Evidence from the capital Market. Journal of Political Economy 92, 1134-1157.

Saint-Paul, G., 2002. The political economy of employment protection. Journal of Political Economy 110, 672–704.

Scoville, J., 1971. Influences on unionization in the U.S. in 1966. Industrial Relations 10, 354-361.

Serfling, M., 2016. Firing costs and capital structure decisions. The Journal of Finance 71, 2239-2286.

Shea, J., 1997. Instrument relevance in multivariate linear models: A simple measure. Review of Economics and Statistics 79, 348-352.

Simintzi, E., Vig, V., Volpin, P., 2015. Labor protection and leverage. The Review of Financial studies 28, 561-591.

Skinner, D., 2008. The evolving relation between earnings, dividends, and stock repurchases. Journal of Financial Economics 87, 582-609.

Slater, S., Zwirlein, T., 1996. The structure of financial strategy: Patterns in financial decision making. Manage. Decis. Econ 17, 253-266.

Stephens, C., Weisbach, M., 1998. Actual share reacquisitions in open-market repurchase programs. The Journal of Finance 53, 313-333.

Stock, J. H., Wright, J., Yogo, M., 2002. A survey of weak instruments and weak identification

in generalized method of moments. Journal of Business and Economic Statistics 20, 518-529.

Tian, X., Wang, W., 2016. Hard marriage with heavy burdens: Organized labor as takeover deterrents. AFA 2015 Boston Meeting; Kelley School of Business Research Paper No. 15-68.

Tong, Z., 2011. Firm diversification and the value of corporate cash holdings. Journal of Corporate Finance 17, 741-758.

Tong, J., Bremer, M., 2016. Stock repurchases in Japan: A solution to excessive corporate saving?. Journal of the Japanese and International Economies 41, 41-56.

Tong, Z., Huang, H., 2018. Labor unions and corporate cash holdings: Evidence from international data. The Journal of Financial Research 41, 325-350.

Tran, N., Weigardh, A., 2013. Repurchases on the Swedish stock market: A good long-term investment?. Bachelor Thesis in Economics Mälardalen University.

Vafeas, N., Joy, M., 1995. Open market share repurchases and the free cash flow hypothesis G35, Economics Letters 48, 405-410.

Verdugo, M., Jordán de Urríes, F., Jenaro, C., Caballo, C. and Crespo, M. (2006), Quality of Life of Workers with an Intellectual Disability in Supported Employment. Journal of Applied Research in Intellectual Disabilities, 19: 309-316.

Vermaelen, T., 1981. Common stock repurchases and market signaling: An empirical study. Journal of Financial Economics 9, 139-183.

Visser, J., 2006. Union membership statistics in 24 countries. Monthly Labor Review, Bureau of Labor Statistics 129, 38-49.

Watts, R., 1973. The information content of dividends. The Journal of Business 46, 191-211.

Watts, R., 2003. Conservatism in Accounting Part I: Explanations and Implications. Accounting Horizons 17, 207-221.

Yu, B., 2010. Employee rights and dividend policy around the world. Working paper, Meredith College.